ORDER NO. VSD9909M910A
D20

Service Manual

DVCPRO

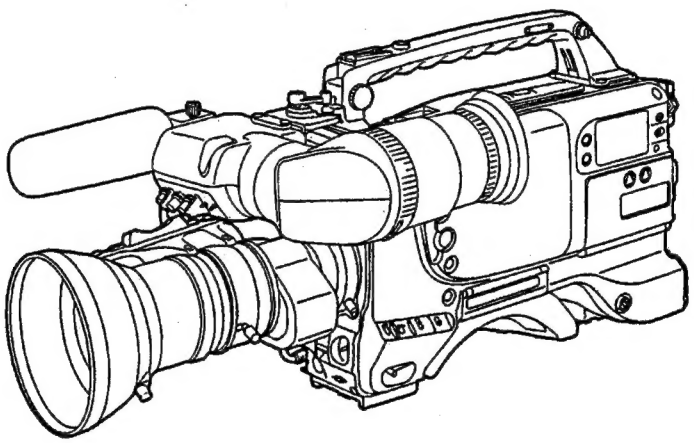
Vol.1

DIGITAL CAMERA/VTR

AJ-D700AP/E
AJ-D800AE

Sec.1 Operating Instructions
Sec.2 Service Information
Sec.3 Maintenance / Disassembly Procedures & Mechanical Adjustment
Sec.4 Electrical Adjustment
Sec.5 Block Diagrams
AJ-D800AE Additional Information

AJ-D700 Revision Service Manual
This Service Manual Contains the AJ-D700 up-date service information's



Please refer to the Service Manual Volume2 (Order No. VSD9909M910B) for Schematic Diagrams, Circuit Board diagrams and Exploded Views & Parts List & AJ-D800AE Additional Information.

Panasonic

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

INTRODUCTION

This Service Manual (Volume 1) contains technical information such as Operating Instructions, Service Information, Maintenance/Disassembly procedures & Mechanical Adjustment Procedures, Electrical Adjustment Procedures and Block Diagrams which will allow service personnel to understand and service the Panasonic DVCPRO Camera Recorder models AJ-D700P (NTSC), AJ-D700E (PAL), AJ-D700AP (NTSC), AJ-D700AE (PAL) and AJ-D800AE (PAL).

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Specifications

AJ-D700AP

General

Power supply voltage:	12 V DC
Power consumption:	21 W

Operating temperature:	32°F to 104°F
Storage temperature:	−4°F to 140°F
Operating humidity:	Less than 85% (relative humidity)
Continuous operating time:	Approx. 90 min. (using 1 Anton Bauer Trimpac 14 battery)
Weight:	Approx. 12.87 lbs (5.85 kg) (incld. main unit, viewfinder, lens, battery pack, tape and microphone)
Dimensions:	4 1/2″ (W)×10 1/16″ (includ. handle) (H)×12 7/8″ (D) 119.2×255.5×326.3 mm

Camera Section

Pick-up devices:	1/2-inch on-chip FIT type of CCD
System:	RGB 3-CCD system
Picture elements:	410,000 pixel
Spectral system:	F1.4 prism system
Built-in filters:	1; 3200K 2; 5600K+1/4 ND 3; 5600K 4; 5600K+1/16 ND
Quantization:	10-bit A/D (R, G and B channels), 14.3 MHz
Digital signal processing:	16-bit long operation, 14.3 MHz/28.6 MHz
Horizontal drive frequency:	14.3 MHz
Programmable gains:	3 positions can be set from among −3, 0, 3, 6, 9, 12, 15, 18, 21, 24 and 30 dB.
Super gain:	30 dB
Shutter speeds:	1/100, 1/120, 1/250, 1/500, 1/1000 and 1/2000 sec. Synchro scan mode; 1/30.4–1/57.4 sec., 1/61.7–1/250 sec.
Lens mount:	1/2″ Bayonet type
Sensitivity:	F8 (2000 lux, 89.9% reflection)
Minimum subject brightness:	2 lux (F1.4, +30 dB)
Image S/N ratio:	62 dB (typical)
Horizontal resolution:	750 lines (center)
Vertical resolution:	400 lines/more than 450 lines (Super V mode)
Sampling frequency:	14.3 MHz/28.6 MHz
Registration:	Below 0.03% (entire range) (excld. lens)
Geometric distortion:	Below measurable limit (excld. lens)

Viewfinder (option, AJ-VF10)

CRT:	1.5″ monochrome
Horizontal resolution:	600 lines (center)
Controls/Switches:	Controls; BRIGHT, CONTRAST, PEAKING Switches; TALLY, ZEBRA

VTR Section

VTR Video System (during playback on a standard playback unit)

Bands:	Brightness; 30 Hz to 5.75 MHz+1.0 dB/−3.0 dB
S/N ratio:	55 dB
K factor (2T pulse):	Within 2%
Y/C delay:	Within 20 ns

VTR Audio System (during playback on a standard playback unit)

Sampling frequency:	48 kHz (synchronized to video)
Quantization:	16-bits/sample
Frequency response:	20 Hz to 20 kHz±1.0 dB (at reference level)
Dynamic range:	85 dB or more (at 1 kHz, AWTD)
Distortion:	Within 0.1% (at 1 kHz, operating level)
Wow/flutter:	Below measurable limit
Head room:	20 dB
Emphasis:	T1=50 µs, T2=15 µs (can be turned ON/OFF)

VTR Tape Running System

Tape speed:	33.820 mm/s
Recording/playback time:	Approx. 66 min. (using the AJ-P66MP)
FF/REW time:	Approx. 3 min. (using the AJ-P66MP)

Connectors

Input

AUDIO IN CH1/CH2 (XLRX2, 3-pin, female):	MIC/LINE switchable, balanced, more than 10 kohm MIC; Menu setting to −60/−50/−40 dBu LINE; Menu setting to −6/0/+4 dBu
MIC IN (XLR, 3-pin, female):	Phantom +48 V, −60 dBu, balanced, 3 kohm (Menu setting to −60/−50/−40 dBu)
GENLOCK IN (BNC):	1.0 Vp-p, 75 ohm
TIME CODE IN (12-pin):	0.5 to 18 Vp-p, 10 kohm

Output

CAMERA OUT (BNC):	1.0 Vp-p, 75 ohm
VIDEO OUT (BNC):	1.0 Vp-p, 75 ohm
AUDIO OUT (XLR, 3-pin, male):	+4 dBu, balanced, low-impedance (Menu setting to CH1/CH2/MIX)
AUDIO CH1/CH2 OUT (12-pin TC IN/OUT combined):	
TIME CODE OUT (12-pin):	1.5 Vp-p, 75 ohm
PHONES (mini-jack×1):	

Other

DC IN (XLR, 4-pin, male):	DC 11 to 17 V
DC OUT (4-pin):	DC 11 to 17 V, maximum rated current; 0.1 A
LENS (12-pin):	
REMOTE (ECU, 6-pin):	

Accessories

Shoulder Belt (1)
Sony battery connector (screw included)
VIDEO IN connector (1)
AUDIO LEVEL CH1 control knob (screw included) (1)

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Related Components

Power supply related
AU-BP220, AU-BP402 battery packs
AG-B425 battery charger (for charging the AU-BP220 and AU-BP402 battery packs)
AU-M402H battery case
AJ-B75 AC adapter

Viewfinder
AJ-VF10, AJ-VF15 1.5-inch viewfinder
AJ-VF53 5-inch viewfinder

External VTR-related
Portable video cassette recorder
AJ-YA710P time code input/output/video input adapter
AJ-YA700P 26-pin output adapter (for connecting an external VTR to the 26-pin interface)
AQ-EC1 extension control unit
Connection cables
- AQ-C2605 26-pin (VTR) cable
- SHAN-C12TCA multi connector cable

Audio components
AJ-MC700P microphone kit
AJ-MH700P microphone holder
WX-RA700 wireless receiver
WX-R980 camera attachment

Maintenance products
AJ-CL12MP cleaning tape
AJ-SC900 soft carrying case
SHAN-B700 carrying case
SHAN-RC700 rain cover

General

Power supply voltage:	12 V DC
Power consumption:	22 W

Operating temperature:	0°C to 40°C
Storage temperature:	−20°C to 60°C
Operating humidity:	Less than 85% (relative humidity)
Continuous operating time:	Approx. 90 min. (using 1 Anton Bauer Trimpac 14 battery)
Weight:	Approx. 5.85 kg (includ. main unit, viewfinder, lens, battery pack, tape and microphone)
Dimensions:	119.2 (W)×255.5 (includ. handle) (H)×326.3 (D) mm

Camera Section

Pick-up devices:	1/2-inch on-chip FIT type of CCD
System:	RGB 3-CCD system
Picture elements:	480,000 pixel
Spectral system:	F1.4 prism system
Built-in filters:	1; 3200K 2; 5600K+1/4 ND 3; 5600K 4; 5600K+1/16 ND
Quantization:	10-bit A/D (R, G and B channels), 14.4 MHz
Digital signal processing:	16-bit long operation, 14.4 MHz/28.8 MHz
Horizontal drive frequency:	14.4 MHz
Programmable gains:	3 positions can be set from among −3, 0, 3, 6, 9, 12, 15, 18, 21, 24 and 30 dB.
Super gain:	30 dB
Shutter speeds:	1/60, 1/120, 1/250, 1/500, 1/1000 and 1/2000 sec. Synchro scan mode; 1/29.9–1/47.6 sec., 1/51.5–1/252 sec.
Lens mount:	1/2″ Bayonet type
Sensitivity:	F8 (2000 lux, 89.9% reflection)
Minimum subject brightness:	2 lux (F1.4, +30 dB)
Image S/N ratio:	60 dB (typical)
Horizontal resolution:	750 lines (centre)
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GENLOCK IN (BNC):	1.0 Vp-p, 75 ohm
TIME CODE IN (12-pin):	0.5 to 18 Vp-p, 10 kohm

Output

CAMERA OUT (BNC):	1.0 Vp-p, 75 ohm
VIDEO OUT (BNC):	1.0 Vp-p, 75 ohm
AUDIO OUT (XLR, 3-pin, male):	0 dBu, balanced, low-impedance (Menu setting to CH1/CH2/MIX)
AUDIO CH1/CH2 OUT (12-pin, TC IN/OUT combined):	−20 dBu, unbalanced, low-impedance
TIME CODE OUT (12-pin):	1.5 Vp-p, 75 ohm
PHONES (mini-jack×1):	

Other

DC IN (XLR, 4-pin, male):	DC 11 to 17 V
DC OUT (4-pin):	DC 11 to 17 V, maximum rated current; 0.1 A
LENS (12-pin):	
SPARE (6-pin):	

Accessories

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VIDEO IN connector (1)
AUDIO LEVEL CH1 control knob (screw included) (1)

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Audio components
AJ-MC700P microphone kit
AJ-MH700P microphone holder

Maintenance products
AJ-CL12MP cleaning tape
AJ-SC900 soft carrying case
SHAN-B700 carrying case
SHAN-RC700 rain cover

***AQ-EC1 is not available in European market.**
For further details, consult with your dealer.

SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohm meter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. The resistance value must be more than 5MΩ.

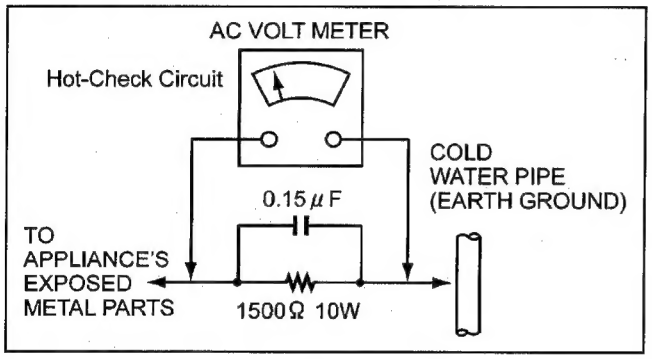


Figure1

LEAKAGE CURRENT HOT CHECK (See Figure 1)

1. Plug the AC cord directly into the AC outlet.
   Do not use an isolation transformer for this check.
2. Connect a 1.5Ω, 10W resistor, in parallel with a 0.15μF capacitor, between each exposed metallic part on the set an a good earth ground such as a water pipe, as shown in Figure1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet repeat each of the above measurements.
6. The potential at any point should not exceed 0.15 volts RMS. A leakage current tester (Simpson Model 229 equivalent) may be used to make the hot checks, leakage current must not exceed 0.1 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically sensitive (ED) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground.
   Alternatively, obtain and wear a commercially available discharging wrist trap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as alminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it.
   (most replacement ES devices are package with leads electrically shorted together by conductive foam, alminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise hamless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

X-RADIATION

WARNING

1. The potential source of X-radiation in EVF sets is the High Voltage section and the picture tube.
2. When using a picture tube test jig for service, ensure that jig is capable of handling 10kV without causing X-Radiation.

Note : It is important to use an accurate periodically calibrated high voltage meter.

3. Measure the High Voltage. The meter (electric type) reading should indicate 2.5kV, ± 0.15kV. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure. To prevent an X-Radiation possibility, it is essential to use the specified picture tube.

CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the appliance.

ATTENTION:
The product you have purchased is powered by a nickel cadmium battery which is recyclable. At the end of it's useful life, under various state and local laws, it is illegal to dispose of this battery into your municipal waste stream.
Please call 1-800-8-BATTERY for information on how to recycle this battery.

ATTENTION:
Le produit que vous avez acheté est alimenté par une pile au nickel-cadmium. La pile est recyclable. Pour obtenir des renseignements sur les façons de recycler cette pile, appeler au 1-800-8 BATTERY.

Replace battery with part No. CR2032 only.
Use of another battery may present a risk of fire or explosion.
Caution—Battery may explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

FCC NOTE:
This device complies with Part 15 of the FCC Rules. To assure continued compliance follow the attached installation instructions and do not make any unauthorized modifications.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

WARNING:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

is the safety information.

■ **DO NOT REMOVE PANEL COVER BY UNSCREWING.**
To reduce the risk of the electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

WARNING:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

Lithium Battery

Warning
The lithium battery in this equipment must only be replaced by qualified personnel. When necessary, contact your local Panasonic supplier.

"The lithium battery is a critical component (type number CR2032 manufactured by Panasonic).

It must never be subjected to excessive heat or discharge. It must therefore only be fitted in equipment designed specifically for its use.

Replacement batteries must be of the same type and manufacturer. They must be fitted in the same manner and location as the original battery, with the correct polarity connections observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose. It should be disposed of in waste products destined for burial rather than incineration."

CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

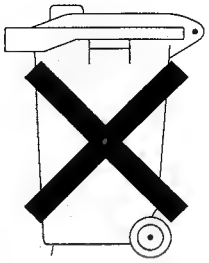
VARNING
Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

ADVARSEL!
Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyypiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

is safety information.

Attention/Attentie

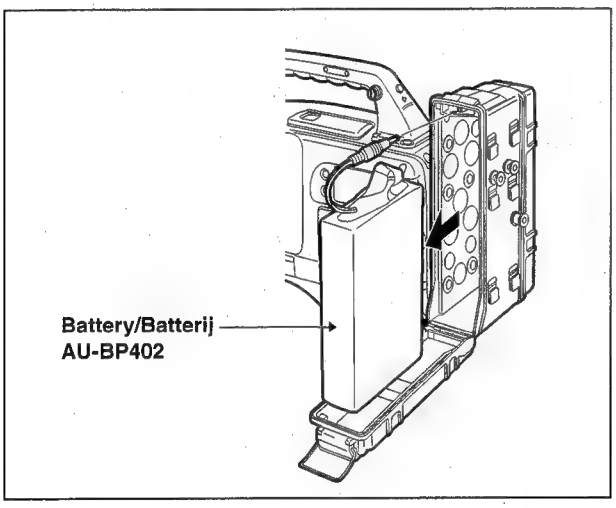


- Batteries are used for the main power source and memory back-up in the product.
  At the end of their useful life, you should not throw them away.
  Instead, hand them in as small chemical waste.
- Voor de primaire voeding en het reservegeheugen van het apparaat wordt gebruikgemaakt van een batterij.
  Wanneer de batterij is uitgeput, mag u deze niet gewoon weggooien, maar dient u deze als klein chemisch afval weg te doen.

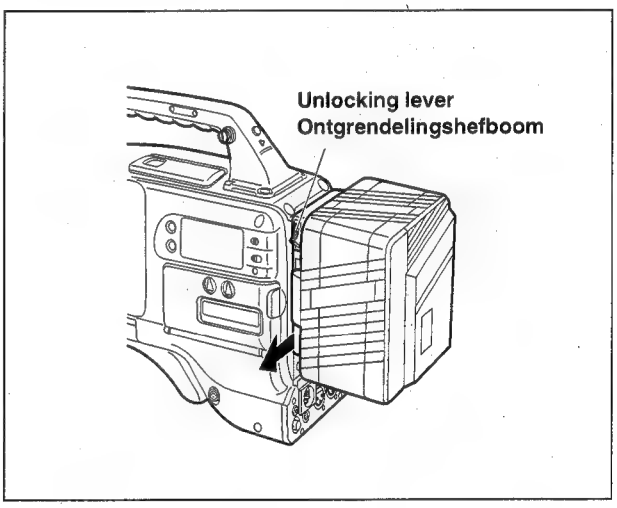
To remove the battery/Verwijderen van de batterij

Main Power Battery (Ni-Cd Battery)
Batterij Voor Primaire Voeding (Nikkelcadmiumbatterij)

Battery/Batterij AU-BP402



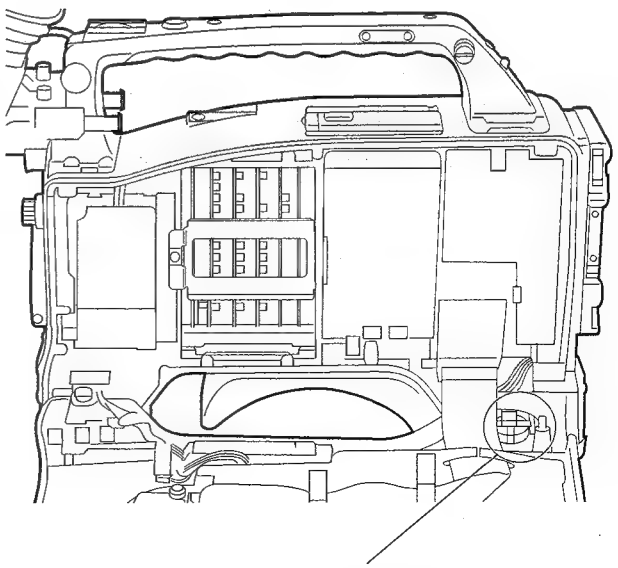
Anton/Bauer Battery
Anton/Bauer-Batterij



- **If a battery made by any other manufacturer is to be used, check the Operating Instructions accompanying the battery.**
- **In geval u een batterij van een anden fabrikant zou gebruiken, gelieve dan eerst zorgvuldig de gebruiksaanwijzing van deze batterij te lezen.**

Back-up Battery (Lithium Battery)
Batterij Voor Reservegeheugen (Lithiumbatterij)

- For the removal of the battery for disposal at the end of its service life, please consult your dealer.
- Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.



Back-up Battery (Lithium Battery)
Batterij Voor Reservegeheugen (Lithiumbatterij)

SECTION 1

OPERATING INSTRUCTIONS

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The model AJ-D700A integrates a color video camera which employs three frame interline transfer (FIT) CCDs with 410,000 device on-chip lenses with a DVCPRO format VTR which is equipped with the latest compression technology.
The AJ-D700A is particularly compact and light weight with low power consumption, and realizes the optimal functions and performance for an electronic news gathering (ENG) VTR-integrated camera such as high picture quality and sensitivity, mobility, dustproofing and dampproofing, etc.
In addition, both the camera section and the VTR employ a digital signal processing system which further improves picture quality and realizes a system for controlling setting menu and subject data by using world standard memory cards.

Features of the Camera Section

The camera section of the AJ-D700A has the following features.
- High sensitivity: 2000 lux (F8)
- High S/N ratio: 62 dB (standard)
- Ultra-low smear
- Ultra-low flare

Digital signal processing
Signal processing is digitized by a 14.3 MHz/28.6 MHz (typ.) 10-bit AD/DA converter. This improves picture quality, stability and reliability, and allows the viewfinder screen displays as well as numerous adjustment and setup items to be converted to menus.

Setting menu
The setting menu is displayed on the viewfinder screen, and controls the status displays, messages, marker displays, etc. Whether or not to display each item, as well as the display conditions when items are to be displayed, can be selected according to the user's convenience. For example, display ON/OFF for the ! lamp display which informs the user that the unit has entered irregular status can be selected for 7 different conditions.
The setting menu is also used to select various settings and functions and excute memory card operations, etc.

Setup cards
Setting menu and subject data can be stored on SRAM memory cards with a capacity of 64 kilobytes or greater which conform to PCMCIA standard ratings as setup cards. Stored data can be saved individually or according to the shooting conditions, allowing the same setup conditions to be easily reproduced and assisting in standardizing setup conditions between individual data.

High-function electronic shutter
Using the built-in electronic shutter achieves steady images even of quickly moving subjects. In addition, the following special operation modes can also be selected.
- Synchro scan mode: This mode is suited for shooting personal computer and workstation monitor screens, and provides images with little horizontal stripe noise.
- High vertical resolution (Super V) mode: This mode provides images with high vertical resolution compared to standard mode.

Wide range of video gain selections
Eleven gain values can be selected from −3 dB to +30 dB using the setting menu and the GAIN switch. The high S/N ratio allows images with little noise to be obtained even when the gain is increased for shooting in dark locations.

Automatic adjustment and memory functions for black balance/white balance
The black set, black balance and white balance can be automatically adjusted by simple switch operations. Adjustment values are held in the memory even if the power for the unit is turned off, so there is no need to readjust the balance each time the power is turned on.
There are two memory systems for white balance which can hold four adjustment values each for the CC and ND filters, making a total of eight adjustment values. When adjustment values matching the illumination conditions are selected from among the values stored in the memory, the unit is automatically adjusted to the corresponding white balance. (A menu setting also allows adjustment of only two values instead of the values for each filter.) In addition, when the unit is shipped from the factory, the white balance value for 3200K is stored in the memory as a preset value. This value can be called when there is no time to adjust the white balance, etc.

Character display function
The unit is equipped with a function that displays switch settings, the automatic adjustment status for black balance and white balance, warning displays, etc. on the viewfinder screen.
In addition, when using an Anton Bauer Digital Magnum series battery as the unit's power supply, the remaining battery level can be displayed numerically on the viewfinder screen.

Warning system for displaying the VTR section status
The unit informs of VTR trouble, the end of the tape, battery wear, etc. with various warning lamps and a warning tone. The remaining tape time can also be checked by the character display inside the viewfinder.

Four filter disks as standard equipment
CC (color temperature conversion) and ND (neutral density) filters are provided as standard equipment. This allows the optimal filter setting to be selected from among four combinations in accordance with the brightness of the subject.

Fine adjustment of the automatic iris reference value
The reference value for automatic iris adjustment can be finely adjusted by setting menu operations.

Auto close function
The unit is equipped with an auto close function which automatically closes the lens in the following cases.
- When the black balance is automatically adjusted.
- When the power is turned off in the auto iris mode.

Generation of SMPTE color bar and reference audio signals
The camera section contains a circuit which generates an SMPTE type color bar signal to facilitate color monitor adjustments, and a circuit which generates a reference level audio signal to facilitate audio level adjustments.

Functions and circuits for assuring high picture quality
The AJ-D700A is equipped with the following functions (and circuits) in order to assure high picture quality and is designed to make the fullest use of the advantages of the high-performance CCD.
- A built-in AUTO KNEE circuit achieves a wide dynamic range which allows large signals to pass through.
- A built-in 2-line image enhancer
- A built-in shading compensation function for use with a lens extender
- A built-in sawtooth wave generator for adjustments
- A zebra pattern ON/OFF selector switch which selects three types of zebra patterns including spot zebra from two levels of zebra patterns.

Audio functions
- A phantom power supply type super-cardioid microphone (option) can be attached and it can also be detached from the main unit for use in interviews.
- Microphone can also be connected, and can be attached to the main unit using the AJ-MH700P microphone holder (option).
- The audio CH1 recording level can be easily adjusted at the front panel of the unit.

Recording by an external VTR
When an external VTR is connected using the 26-pin output adaptor (option, AJ-YA700P), recording can be performed by the external VTR instead of the internal VTR.

Remote control
Connecting the Extension Control Unit (option, AQ-EC1) allows a portion of the camera section functions to be operated by remote control.

Features of the VTR section

Digital system
The VTR section features a component digital recording system that employs the latest compression technology and non-compressed PCM recording for audio. This system provides superior S/N, frequency band and waveform characteristics as well as reproduction of detailed areas, etc., and realizes even higher picture and sound quality.

Rec review function
This function automatically rewinds the tape and plays back the last two seconds recorded, allowing recorded contents to be quickly checked.

Playback function
Playback pictures (black-and-white pictures) can be seen on the viewfinder screen. In addition, color playback pictures can be seen on a color monitor connected to the VIDEO OUT connector on the main unit.

Built-in time code generator/reader
Time code information can be recorded and played back on a dedicated subcode track.

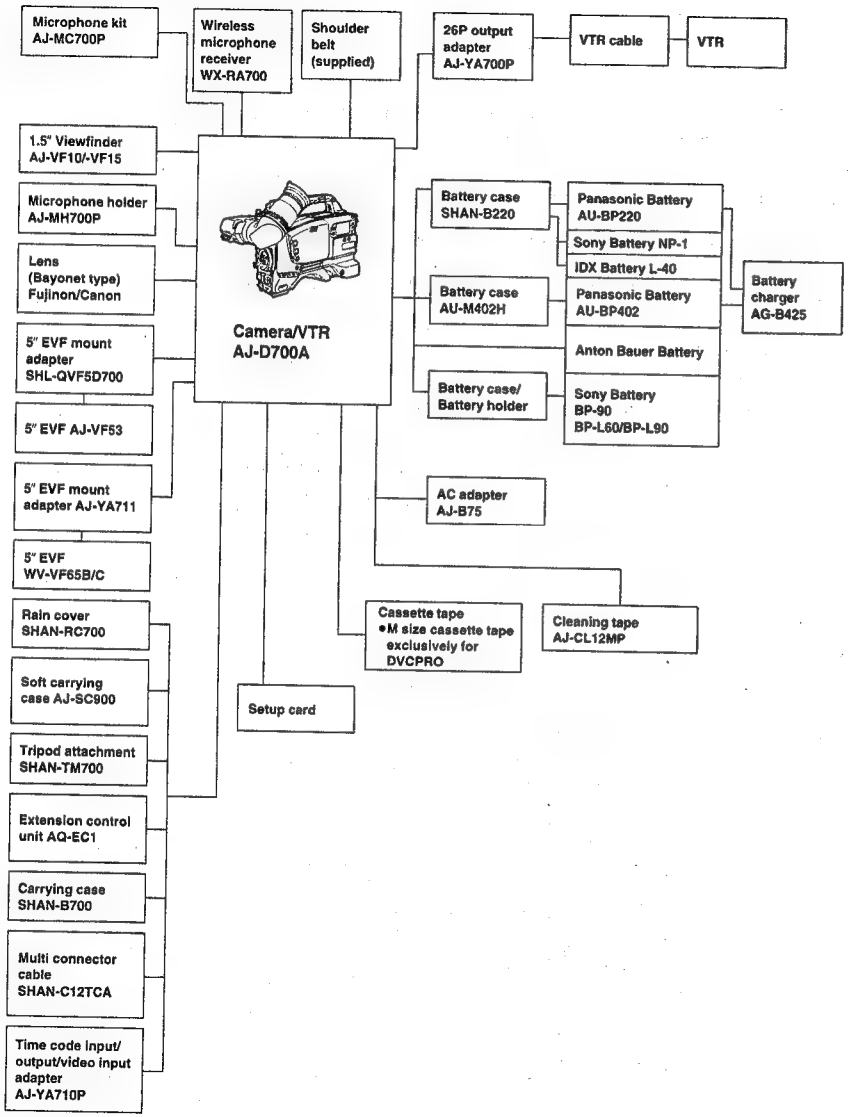
Locking of the time code to an external source
The built-in time code generator can be locked to an external generator. Also, the built-in time code generator uses a lithium battery as its back-up power supply, allowing time codes to be backed up for approximately one year even if power is not supplied to the unit.

Built-in DOLBY NR System*
A Dolby B Noise Reduction System is built in for audio recording in the longitudinal direction.

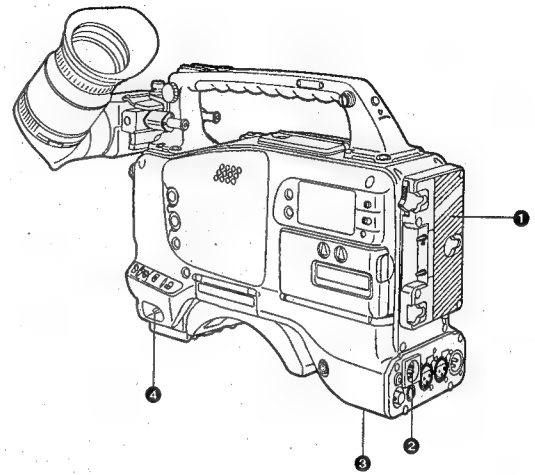
Successive shooting
Images can be shot successively within an accuracy of 0–+1 frame simply by pressing the VTR START button or the lens VTR button.

*Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"Dolby" and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation.

System Configuration



Controls and Their Functions



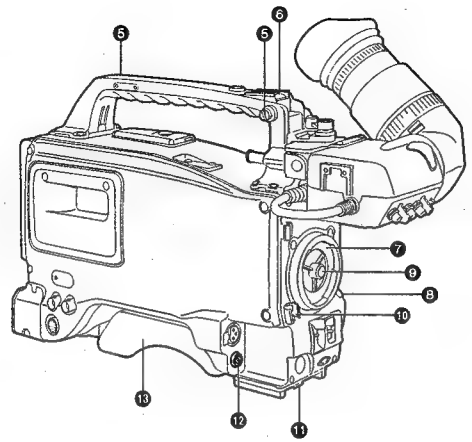
Power Supply Section

❶ **Battery holder**
The battery pack (option) made by Anton Bauer is mounted onto this holder.

❷ **DC IN (external power input) connector (XLR, 4P)**
The AJ-B75 AC adapter (option) is plugged into this socket when the unit is to be operated by AC power. An external battery is plugged in when an external battery is to be used to operate the unit.

❸ **BREAKER (circuit breaker) button**
In order to protect the equipment, the circuit breaker is tripped and the power is automatically turned off when an excessively high level of power flows inside. Upon completion of the internal inspection and adjustments, push this button back in. The power will come back on provided that there is no trouble inside the unit.

❹ **POWER switch**
ON: Set to this position to turn on the unit's power.
OFF: Set to this position to turn off the unit's power.



Accessory Mounting Section

5 Hook for mounting shoulder belt
Attach the accessory shoulder belt to this hook.

8 Light shoe
Mount the video light, etc. onto this shoe.

7 Lens mount (bayonet type)
Mount the lens here.

8 Lens clamping lever
Insert the lens into the lens mount 7, and turn the lens mount ring using this lever to clamp the lens.

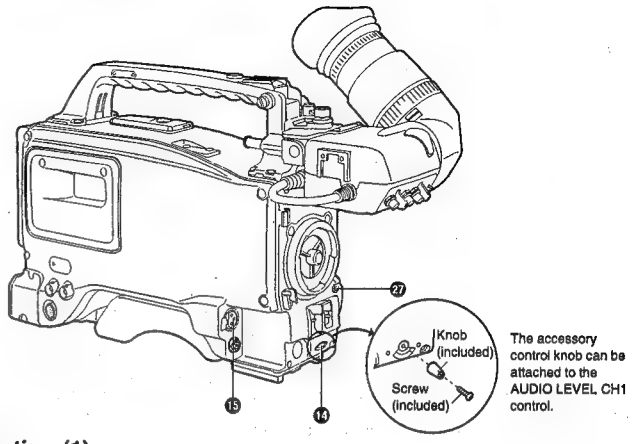
9 Lens mount cap
Press up the lens clamping lever 8 to remove this cap. Keep the cap in place if the lens is not going to be mounted.

10 Lens cable clamp
This is for clamping the lens cable.

11 Tripod mount
When the unit is to be secured to a tripod, mount the optional tripod attachment.

12 LENS connector (12-pin)
Hook up the lens connecting cable to this connector. Consult with your dealer concerning the lens which you are going to use.

13 Shoulder pad
Adjust this pad to facilitate operation when carrying the unit on your shoulder. Its position can be brought forward or backward and adjusted by loosening the two set screws.



Audio Function Section (1)

14 AUDIO LEVEL CH1 (audio channel 1 recording level) control
When the AUDIO SELECT CH1/CH2 switch 17 is set to MAN, the recording level of audio channel 1 can be adjusted by this control in addition to the AUDIO LEVEL CH1 control 16 on the side panel.

15 MIC IN (microphone input) jack (XLR, 3-pin)
Connect an optional microphone to this jack. The power for the microphone is supplied from this jack.

Audio Function Section (2)

16 AUDIO LEVEL CH1/CH2 (audio channel 1/2 recording level) controls
When the AUDIO SELECT CH1/CH2 switch 17 is set to MAN, the audio level of audio channels 1 and 2 can be adjusted using these controls.
However, the audio CH1 level can also be adjusted using the AUDIO LEVEL CH1 control 14 on the front panel.

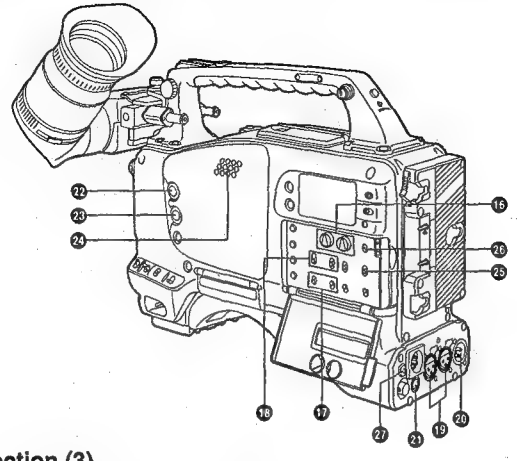
17 AUDIO SELECT CH1/CH2 switch (audio channel 1/2 auto/manual level adjustment selector) switch
This selects the method used to adjust the audio levels of audio channels 1 and 2.
AUTO: For adjusting the levels automatically.
MAN: For adjusting the levels manually.

18 AUDIO IN (audio input selector) switch
This selects the input signals to be recorded on audio channels 1 and 2.
FRONT [MIC]: The microphone input signals connected to the MIC IN jack 15 are recorded.
REAR [MIC]: The microphone input signals connected to the AUDIO IN CH1/CH2 connectors 19 are recorded.
REAR [LINE]: The line input signals connected to the AUDIO IN CH1/CH2 connectors 19 are recorded.

19 AUDIO IN CH1/CH2 (audio input channel 1/2) connectors (XLR, 3P)
An audio component or microphone is connected here.

20 AUDIO OUT connector (XLR, 3P)
This is connected to an audio component. The audio channels can be selected on the setting menu.

21 DC OUT (DC power output) connector
This is the DC 12 V output connector. A current of approximately 100 mA can be taken out.



Audio Function Section (3)

㉒ ALARM (warning tone volume) control
This adjusts the warning tone volume heard from the speaker ㉔ or the earphone connected to the PHONES jack ㉗. When it is set to the lowest position, the warning tone is not audible. However, by making changes to the inside parts, the tone can be made audible even when the control is at its lowest position.

㉓ MONITOR (volume) control
This adjusts the volume of the sound other than the warning tone—the sound from the speaker ㉔ or earphone ㉗. When it is set to the lowest position, no sound is heard.

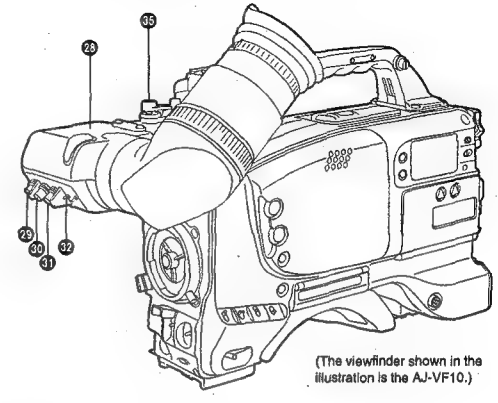
Audio Function Section (4)

㉔ Speaker
During recording, the EE sound can be monitored; during playback, the playback sound can be monitored.
The warning tone is heard through the speaker in synchronization with the flashing or lighting of the warning lamp and warning display.
The speaker sound is automatically muted when an earphone is connected to the PHONES jack ㉗.

㉕ MONITOR SELECT (audio channel selector) switch
This selects the audio channel whose sound is to be heard through the speaker ㉔ or earphone.
CH1: The audio channel 1 sound is output.
CH1, 2: The sound produced by mixing the audio channel 1 and 2 sound or the stereo sound is output. However, only the mixed sound is output from the speaker ㉔.
CH2: The audio channel 2 sound is output.

㉖ MONITOR (sound selector) switch
This selects the sound of the earphone when CH1, 2 is selected with the MONITOR SELECT switch ㉕.
ST: The stereo sound of audio channel 1 and 2 is output.
MIX: The mixed sound of audio channel 1 and 2 is output.

㉗ PHONES (earphone) jack (mini-jack)
When an earphone (option) is connected to this jack, the sound selected by the MONITOR switch ㉖ can be heard. The warning tones relating to the unit's operation or status can also be heard. An earphone enabling a sufficiently high volume of sound to be heard is recommended. When the earphone is connected, speaker ㉔ sound is automatically muted.



(The viewfinder shown in the illustration is the AJ-VF10.)

Shooting (Recording)/Playback Function Section (1)

㉘ Viewfinder (optional accessory)
Black-and-white images can be seen in the viewfinder during recording and playback. Warnings and messages relating to the unit's operating status and settings, zebra pattern, markers (safety zone marker, center marker), etc. can also be seen.

㉙ PEAKING control
This is used to adjust the contours of the images inside the viewfinder to facilitate focusing. It does not affect the camera's output signals.

㉚ CONTRAST control
This is used to adjust the contrast of the screen inside the viewfinder. It does not affect the camera's output signals.

㉛ BRIGHT control
This is used to adjust the brightness of the screen inside the viewfinder. It does not affect the camera's output signals.

㉜ ZEBRA (zebra pattern) switch
This displays the zebra pattern inside the viewfinder.
ON: The zebra pattern is displayed.
OFF: The zebra pattern is not displayed.
When the unit is shipped from the factory, the zebra pattern is set in such a way that those parts with an IRE video level from approx. 70% to 85% are displayed. The displaying of parts with a level ranging from 50% to 110% or more or with a certain level can also be set on the setting menu.

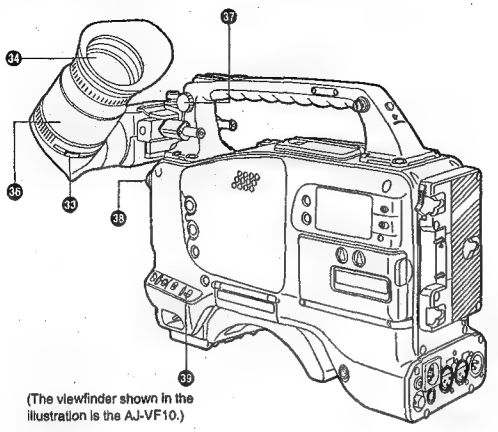
㉝ Diopter control knob
This is adjusted in such a way that the images on the viewfinder screen are seen most clearly in accordance with the dioptric power of the camera's operator.

㉞ Eye cup

㉟ Viewfinder forward-backward/left-right position clamp lever
Loosen this lever to adjust the position of the viewfinder ㉘ in the forward-backward or left-right direction.

㊱ Eyecup forward-backward movement ring
Turn this ring to adjust the position of the eyecup ㉞ in the forward-backward direction.

㊲ Viewfinder stopper screw
To detach the viewfinder ㉘ from the camera, loosen this screw and then detach the viewfinder.



(The viewfinder shown in the illustration is the AJ-VF10.)

Shooting (Recording)/Playback Function Section (2)

㉟ CC/ND FILTER (filter selector) knob

This selects the filter to match the light source which is illuminating the subject.
If the setting of this knob is changed when the menu display mode has been set to "3" (default setting), the new setting will appear for about 3 seconds on the setting change message display area of the viewfinder screen.

■ **The knob and filter settings are listed below.**

FILTER knob setting	Description
1	3200K
2	5600K+1/4ND
3	5600K
4	5600K+1/16ND

■ **Examples of filter settings to match shooting conditions**

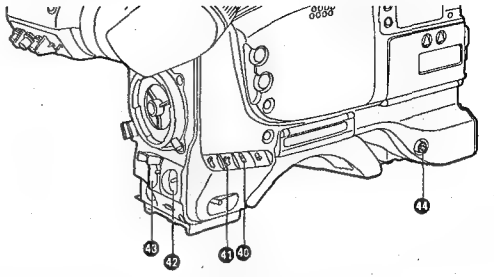
Filter	Shooting condition
1	Sunrise, sunset, inside a studio
2	Outdoors under a clear sky
3	Outdoors under a cloudy or rainy sky
4	Snow scenes, high mountains, coastlines and other extremely clear and bright scenes

㉞ WHITE BAL (white balance memory selector) switch

PRST: Set to this position when there is no time to adjust the white balance. The white balance value for 3200K is stored in the memory.

A or B: When the AUTO W/B BAL switch ㊷ is pressed to the AWB side, the white balance is automatically adjusted in accordance with the setting position of the filter knob ㉟, and the adjustment value is stored in memory A or memory B.

When the FILTER knob and the WHITE BAL switch are set to the same positions as the ones set when the adjustment was made, the adjustment value stored in the memory is called, and the unit is automatically adjusted to the white balance which corresponds to this value.
If the setting of this switch is changed when the menu display mode has been set to "3" (default setting), the new setting will appear for about 3 seconds at the WHITE BAL switch display position on the viewfinder screen. (Example: "W : A")



Shooting (Recording)/Playback Function Section (3)

㊵ OUTPUT (output signal selector)/AUTO KNEE switch

This switch selects the video signals which are to be output from the camera unit to the VTR unit, viewfinder and video monitor. The AUTO KNEE function can be used when the images shot by the camera have been selected.

■ **OUTPUT/AUTO KNEE switch setting positions**

BARS	Color bar signals are output. The AUTO KNEE circuit is not activated. Set the switch to this position in the following cases: •When adjusting the video monitor •When recording color bar signals
CAM, AUTO KNEE OFF	The images shot by the camera are output. The AUTO KNEE circuit is not activated. The default setting is "MANUAL KNEE".
CAM, AUTO KNEE ON	The images shot by the camera are output. The AUTO KNEE circuit is activated.

㊶ GAIN (gain selector) switch

This is used to change the video amplifier's gain in accordance with the lighting conditions during shooting. The gain values corresponding to the L, M and H settings are assigned beforehand on the setting menu. When the unit is shipped from the factory, these settings are: L=0 dB, M=9 dB and H=18 dB.
If the setting of this switch is changed when the menu display mode has been set to "3", the new setting will appear for about 3 seconds at the gain display position on the viewfinder screen. (Example: "12 dB")

㊷ AUTO W/B BAL (white balance/black balance automatic adjustment) switch

AWB: Set to this position for automatically adjusting the white balance. When the WHITE BAL switch ㉞ is now set to "A or B", the adjusted value will be stored in memory A or memory B.

ABB: Set to this position for automatically adjusting the black balance. The adjusted value will be stored in the dedicated memory.

㊸ SHUTTER switch

Set this to ON when using the electronic shutter. When it is pressed to the SEL side, the shutter speed and mode displays change in the ranges preset on the setting menu. If the setting of this switch is changed when the menu display mode has been set to "2" or "3", the new settings will appear for about 3 seconds at the shutter display position on the viewfinder screen.
(Example: ":1/250", ":1/61.7")

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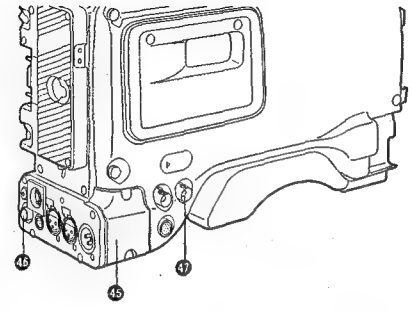
1) **AUTO KNEE function**
When the level is adjusted to people, scenes, etc. for shooting against a very bright background, the background will be whited out and the buildings or scenes in the background will become blurred. If the AUTO KNEE function is activated in cases like these, the background can be reproduced in clear detail. This function is especially effective for shooting in the following conditions:
•When shooting people in shade under a clear sky
•When simultaneously shooting people in vehicles or indoor and the outdoor scenery seen through the windows
•When shooting scenes with a high contrast



44 ECU REMOTE (remote control) connector (6-pin)
Connect the AQ-EC1 extension control unit (option) here.
<Note>
The POWER switches on unit and extension control unit must be set to OFF before the remote control cable is connected or disconnected.

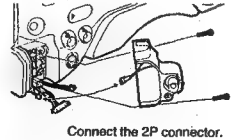
45 VIDEO IN connector (accessory)/26-pin output adapter (option) mount
VIDEO IN connector (accessory) (See below for the mounting method.)
The composite video signals are supplied here. It is used for checking the return signal and recording external input signals.
<Note>
When recording signals input from an external source, recording can only be assured for standard signals.
26-pin output adapter (option) (See page 97 for mounting method.)
The 26-pin output adapter AJ-YA700P (option) is mounted on this section. When the portable VTR is connected as the external VTR, recording can be performed simultaneously with the unit's built-in VTR.

46 VIDEO OUT connector (BNC)
This outputs the video signals (75Ω termination, rated level) to be monitored. During recording, EE images can be monitored; during playback, playback images can be monitored.
While performing settings on the menu, the setting menu can be superimposed onto the shot images appearing on the monitor screen so that the settings can be checked (in which case, the images appear in black and white).

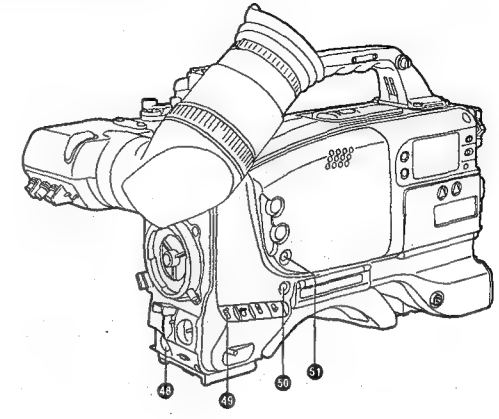
47 CAM OUT (camera output) connector (BNC)
This outputs the composite video signals (75Ω termination, rated level). When a video monitor is connected, the images shot by the camera can be monitored. Even while the VTR is playing back, the camera's images are output at all times.

Mounting the VIDEO IN connector

Remove the blank panel and mount the VIDEO IN connector.



Connect the 2P connector.



Shooting (Recording)/Playback Function Section (4)

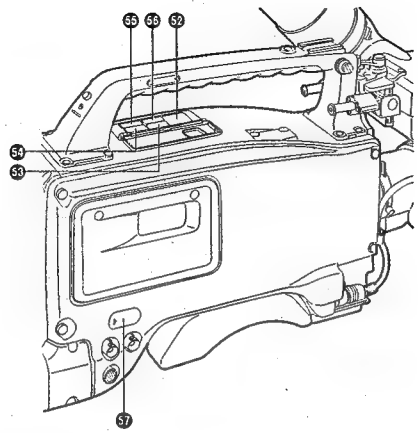
48 VTR START button
When this pressed, recording commences; when it is pressed again, recording stops. This button has the same function as the VTR button on the lens side.

49 VTR SAVE/STBY (tape protection) switch
This selects the power supply status while the VTR recording is temporarily stopped (REC PAUSE).
SAVE: This is the tape protection mode. The cylinder is stopped in the half-loading status. Compared with the STBY position, less power is consumed and the unit can be operated longer using the battery. It takes longer for recording to commence after the VTR START button 48 is pressed in the SAVE position than in the STBY position.
When the switch is set to this position, the VTR SAVE lamp inside the viewfinder lights.
STBY: Recording commences immediately when the VTR START button is pressed.

50 MODE CHECK button
While this button is kept depressed, the camera's setting status is displayed in the viewfinder. It does not affect the camera's output signals. This button can also be used for fine adjustment at the setting menu during synchro scan mode.

51 SUPER IRIS button
This is used when backlight compensation is to be provided. When it is pressed, the switch settings are displayed inside the viewfinder for 3 seconds. When it is pressed again, backlight compensation is released.
Whether the super gain (30 dB) mode or the super iris (backlight compensation) mode is to apply can be selected on the setting menu. This button can also be used for fine adjustment during synchro scan mode.

Super gain: When 30 dB is allotted to the SUPER IRIS button, DTL and other menu settings cannot be performed for this 30 dB.



52 EJECT (cassette eject) button
Press this to insert or eject the cassette.

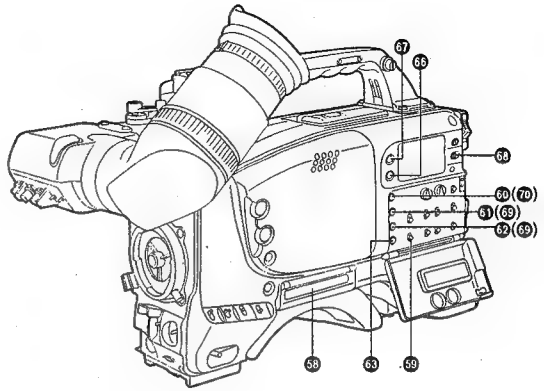
55 REW (rewind) button
Press this to rewind the tape. Its lamp lights during rewinding.
If this button is pressed during playback, the playback images are rewound at approximately quadruple speed while the button is held down.

54 FF (fast forward) button
Press this to fast forward the tape. Its lamp lights during fast forwarding.
If this button is pressed during playback, the playback images are fast forwarded at approximately quadruple speed while the button is held down.

53 PLAY (playback) button
Press this to view the playback images on the viewfinder screen or color video monitor. Its lamp lights during playback.
If this button is pressed again during playback, playback is paused and the lamp goes off. After playback has been paused for 2 minutes, the unit automatically switches to stop status (STOP).

56 STOP button
Press this to stop the tape travel.

57 Emergency screw (inside the rubber cap)
Refer to page 127 "Emergency eject".



Menu Operation Section

58 Setup card insertion slot
The optional setup cards are inserted into this slot.

59 MENU SET/OFF switch
This displays the setting menu on the viewfinder screen.
SET: The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first of the pages which can be displayed appears.)
OFF: The setting menu is not displayed on the viewfinder screen.

63 SHIFT/ITEM button
Each time this button is pressed, the cursor moves on the setting menu page now displayed. Use it when selecting items.
<Note>
This switch functions differently depending on the operation item. Check the function by operating the menu item by item.

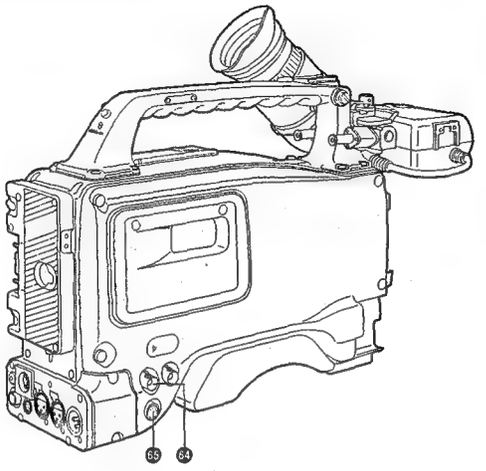
61 UP button
This is used to increment the setting of the item selected on the setting menu by 1 level each time it is pressed or to switch the setting between ON and OFF.

62 DOWN button
This is used to decrement the setting of the item selected on the setting menu by 1 level each time it is pressed or to switch the setting between ON and OFF.

60 PAGE button
This is used to select the setting menu page.

Time Code-Related Section (1)

64 GENLOCK IN connector (BNC)
The reference signal is supplied to this connector for genlocking with the camera section.



65 Multi (TC IN/OUT, AUDIO OUT CH1/CH2) connector
TC IN side:
The time code serving as the reference is input when the time code is locked to an external source.
TC OUT side:
Connect this to the time code TC IN connector on the external VTR when locking the external VTR's time code to this unit's time code.
AUDIO OUT CH1/CH2 side:
This is the audio output connector. The audio signal is output at −20 dB (0 dB=0.775 V), unbalanced.

Time Code-Related Section (2)

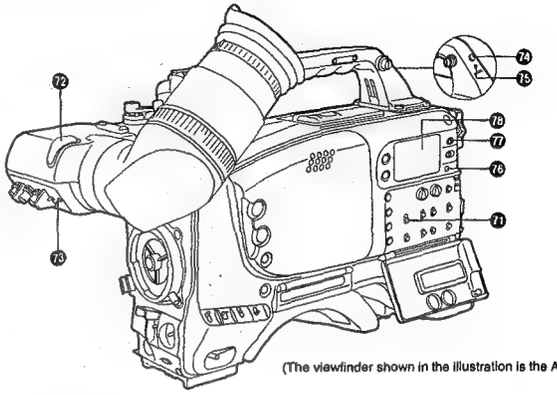
66 HOLD button
The time data appearing on the counter display at the instant when this button is pressed is held. (The time code generator will still continue to run.) When the button is pressed again, the hold status is released. Use the button to ascertain the time at which a particular scene was shot, for example.

67 RESET button
This resets the time data on the counter display to "00:00:00:00". When the TCG switch 71 is set to SET and this button is pressed, the time code or user's bit can be reset to "00:00:00:00" or "00 00 00 00".

68 DISPLAY switch
The time code, CTL or user's bit is made to appear on the counter display depending on the setting positions of this switch and the TCG switch 71.
UB: The user's bit is displayed.
TC: The time code is displayed.
CTL: CTL is displayed.

69 UP button, DOWN button
When setting the time code or user's bit, these buttons increment or decrement by 1 the figure of the digit made to flash by the SHIFT/ITEM button 70.

70 SHIFT/ITEM (digit advance) button
When setting the time code or user's bit, this button is used to cause the digit which is to be set to flash.



(The viewfinder shown in the illustration is the AJ-VF10.)

71 TCG (time code selector) switch
This is used to set the running mode of the internal time code generator.
F-RUN: This position is used when the time code is to be advanced continuously regardless of the VTR's operation.
Set to this position when aligning the time code with the actual time or locking the time code to an external source.
SET: This position is used for setting the time code or user's bit.
R-RUN: This position is used when the time code is to be advanced only while recording is in progress. The time code will be recorded continuously on a tape with a succession of unedited shots.

Warning/Status Display Section

72 Tally lamp
This is activated when the TALLY switch 73 is at HIGH or LOW, and it lights during recording by the VTR section. It flashes in the same way as the REC lamp inside the viewfinder to warn the operator. The brightness when lighted can be selected using the TALLY switch (HIGH or LOW).

73 TALLY switch
This controls the tally lamp 72.
HIGH: The tally lamp is made brighter.
OFF: The tally lamp is extinguished.
LOW: The tally lamp is made darker.

74 Back tally lamp
This functions in the same way as the tally lamp 72 when the back tally switch 75 is set to ON.

75 Back tally switch
This controls the back tally lamp 74.
ON: The back tally lamp operates.
OFF: The back tally lamp does not operate.

76 WARNING lamp
This flashes or lights when trouble occurs in the VTR section.

77 LIGHT switch
ON: This illuminates the display window 78.
OFF: This extinguishes the display window illumination.

78 Display window
The warnings related to the VTR section, remaining battery level, sound level, time data, etc. are displayed in this window.

Power can be supplied to the unit using a battery pack or AC power supply.

Using a battery pack

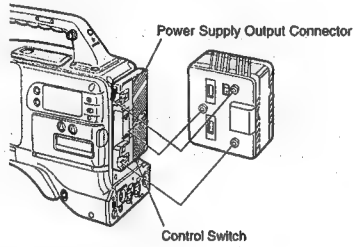
① Panasonic, ② Anton Bauer, ③ Sony or ④ IDX batteries can be used for the battery pack.

Before using ■ battery pack, be sure to charge it completely using ■ battery charger.

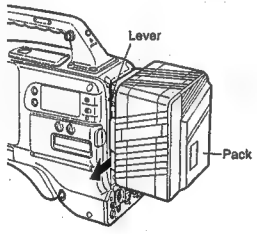
- See the Handling Instructions for the battery pack and battery charger for a detailed explanation of charging methods.

Using an Anton Bauer Battery Pack

1 Mount the battery pack.
Insert the battery pack in the direction of the arrow and then slide it into place.



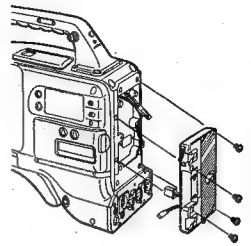
2 When detaching the battery, hold down the detachment lever of the battery holder and slide the battery pack in the direction of the arrow.



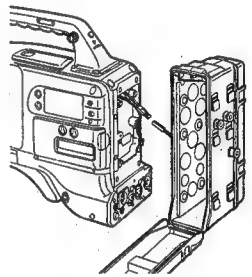
<Note>
The AJ-D700A supports the intelligent battery system and the ultra-light system.
Automatic detection can be performed for intelligent batteries with a remaining battery level of 10% or more. At this time, the remaining battery level is displayed numerically (percentage display) inside the viewfinder. If the power is turned on with a remaining battery level of 10% or less, the voltage is displayed. Also, after intelligent battery detection, the remaining battery level display indicates the level for the intelligent battery even if power is supplied from an external source.

Using the Panasonic AU-BP402 Battery Pack

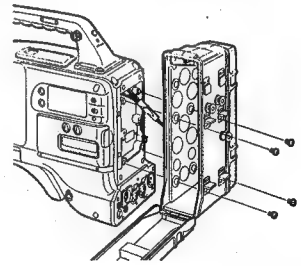
1 Detach the battery mounts.



2 Connect the unit's connectors with the connectors of the AU-M402H battery case.



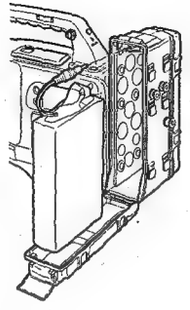
3 Mount the AU-M402H battery case.
Open the battery case cover and lift up the rubber cap to expose the screw holes. Tighten the screws with a screwdriver and mount the case to the unit. Be sure to tighten the screws completely.



<Notes>

- Do not pull strongly on the rubber cap.
- Take care not to catch the connection cord between the battery case and the main unit.

4 Connect the battery pack plug to the connector inside the case and insert the battery pack.

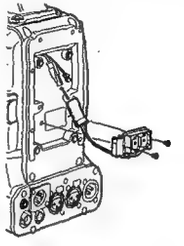


<Note>
The unit's power must be set to OFF before the plug is inserted or removed.

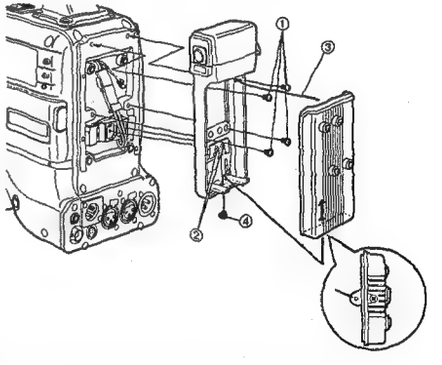
Using a Sony Battery Pack

1 Remove the battery mounts.
See page 24.

2 Mount the accessory battery mounting connector.



3 Mount the Sony battery holder.
Mount the battery case with the cover detached first, and then mount the detached cover as shown in the figure.
① Tighten the mounting screws.
② Tighten the power supply contact screws.
③ Insert the top of the detached cover in the direction of the arrow.
④ Align the hole at the bottom (metal part) of the cover with the hole at the bottom of the case and mount the cover to the battery mounting connector with the screw of the battery holder.

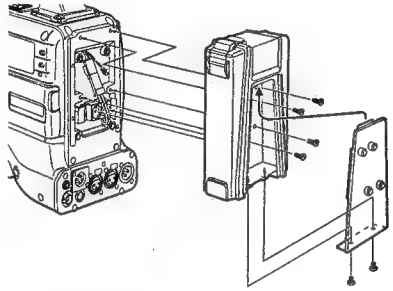


<Note>
Take care when attaching the battery holder that the wires are not pinched.

Using the Sony BP-90 Battery Pack

1 Mount the accessory battery mounting connector.
(See the preceding page.)

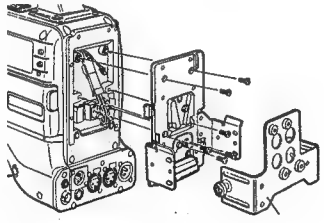
2 Mount the BP-90 battery case.
① Tighten the mounting screws.
② Tichten the power supply contact screws.
③ Insert the top of the detached cover in the direction of the arrow.
④ Align the hole at the bottom (metal part) of the cover with the bottom of the case and mount the cover to the battery mounting connector with the screw.



Using the Sony BP-L60/BP-L90 lithium-ion Battery Pack

1 Attach the supplied battery mounting terminals.

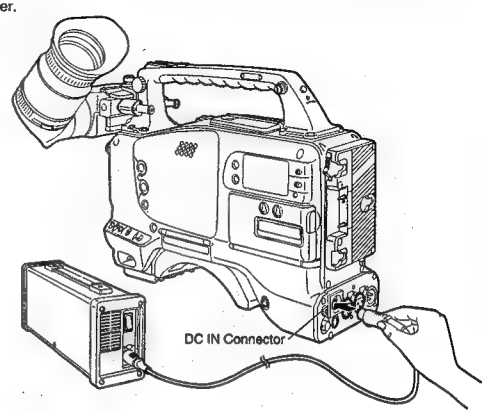
2 Attach the lithium-ion battery holder.
① As shown in the figure, remove the battery clamp, and attach the holder using the mounting screws.
② Tighten the power supply contact screws.
③ Put the battery clamp back into place.



<Notes>
- The unit's power must be set to OFF before the plug is inserted or removed.
- Take care when attaching the battery case that the wires are not pinched.

Using an AC Power Supply (When using the AJ-B75 AC Adapter)

1 Connect the unit's EXT DC IN socket with the DC OUT connector of the AJ-B75 AC adapter.



2 Set the AC adapter's power to ON.

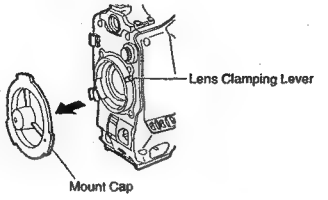
3 Set the unit's power switch to ON.

<Notes>
- When using an external power supply other than the AJ-B75 AC adapter, check the pin signal of the EXT DC IN socket.
- When both a battery pack and AC adapter are connected, power is supplied from the AC adapter.
- When using an AC adapter, the AC adapter's power must be set to ON before the unit's POWER switch is set to ON. If this sequence is reversed, the AC adapter's output voltage will rise slowly and may cause the unit to malfunction.

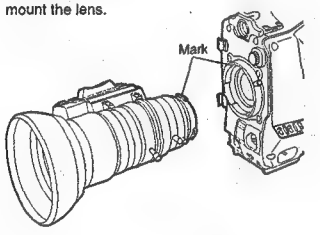
Pin No.	Signal
1	GND
2, 3	—
4	+12 V

Mounting the Lens

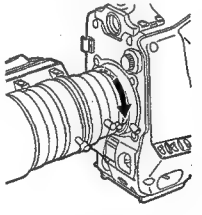
1 Raise the lens clamping lever and remove the mount cap.



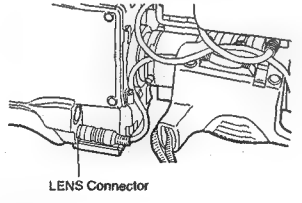
2 Align the indentation at the top center of the lens mount with the center mark of the lens and mount the lens.



3 Lower the lens clamping lever and clamp the lens.



4 Press the cable into the cable clamp and connect it to the LENS connector.



•See the Handling Instructions provided with the lens for lens handling.

<Note>
The lens and camera adjustments listed below may be necessary depending on the lens to be mounted.

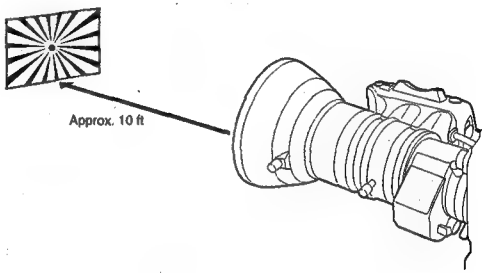
1. Lens flanging adjustment
2. Lens auto iris adjustment
3. Lens white shading adjustment (with this unit)

Adjusting the Lens Flange

When images are not clearly focused at both the telephoto and wide-angle positions during zoom operations, adjust the flange back (the distance from the lens mounting surface to the image formation surface).
Once adjusted, the flange back does not need to be readjusted as long as the lens is not changed.

Adjustment method

Check the position of each part of the lens which must be operated in order to adjust the flange back with the lens Handling Instructions.



Adjusting the Flange Back

1 Set the lens iris to manual.

2 Open the iris. Position the flange back adjustment chart about 10 ft from the lens and illuminate it so that an appropriate image output level is obtained.
If the image level is too high, use the CC/ND filters or the shutter.

3 Loosen the Ff ring clamping screw.

4 Set the zoom ring to the telephoto position manually or by electric drive.

5 Shoot the flange back adjustment chart and turn the distance ring to bring the chart into focus.

6 Set the zoom ring to the wide-angle position.

7 Turn the Ff ring to bring the chart into focus.
At this time, take care not to move the distance ring.

8 Repeat this operation four to seven times until the lens is in focus at both the telephoto and wide-angle positions.

9 Firmly tighten the Ff ring clamping screw.

•Refer to the Operating Instructions of the lens.

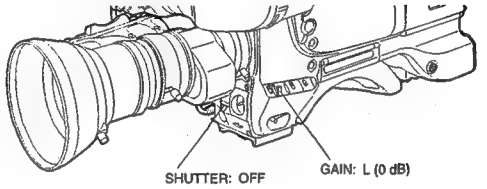
Adjusting the White Shading

The AJ-D700A is adjusted for the Fujinon S18×6.7 BRM4 (with extender) and S18×6.7 BRM4 (without extender) lenses when shipped from the factory. If a lens other than these two lenses is to be used, adjusting the white shading before shooting is recommended. In particular, be sure to adjust the white shading as indicated below when using a 1/2-inch camera lens without an extender (other than the S18×6.7 BRM4 noted above) or a 2/3-inch camera lens via an adapter.

White shading adjustment procedure

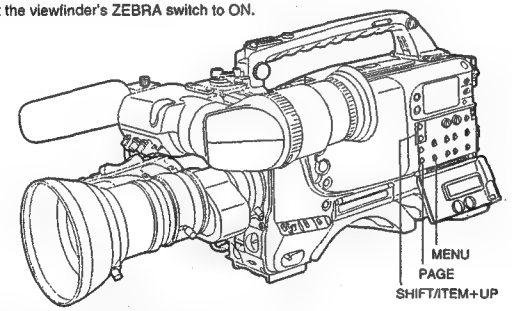
1 Mount a lens to the camera.
Be sure to also connect the lens cable.

2 Set the electronic shutter to OFF and the gain to L (0 dB).



3 If the lens has an extender, remove the extender.

4 Set the MENU SET/OFF switch from OFF to SET while holding down the SHIFT/ITEM and UP buttons to open the menu.
Press the PAGE button until the VF OPERATION page appears.
Set ZEBRA1 DETECT to 70, ZEBRA2 DETECT to 85 and ZEBRA2 to SPOT. (Initial setting mode)
Return the MENU SET/OFF switch from SET to OFF to close the menu.
Set the viewfinder's ZEBRA switch to ON.

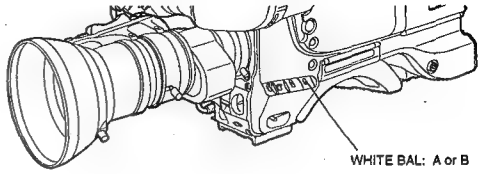


5 Shoot an evenly white paper.
Flickering occurs easily when fluorescent or mercury lamps, etc. are used for lighting. Therefore, use a light source which does no produce flickering such as sunlight or halogen lamps, etc.

6 Set the lens iris to manual and adjust the iris so that the ZEBRA pattern covers the entire screen. If the light strikes the subject in an uneven manner, the ZEBRA pattern will not cover a part of the screen. Therefore, adjust the position of the light source, etc. as necessary.
Check that the lens iris is between F4 to F11. If the lens iris is not within this range, adjust the position of the light source, etc.
(Be sure to set the electronic shutter to OFF.)

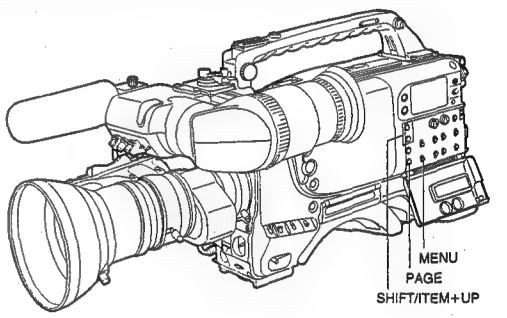
Adjusting the White Shading

7 Set the WHITE BAL selector switch to A or B execute AWB.
Next, execute ABB and then execute AWB again.



8 Repeat step 6.

9 Set the MENU switch from OFF to SET while holding down the SHIFT/ITEM and UP buttons to open the menu.
Press the PAGE button until the AUTO SHADING page appears.
Press the SHIFT/ITEM button to move the arrow on the left to the WHITE position and then press the UP or DOWN button.
ACTIVE appears on the viewfinder to indicate that white shading automatic adjustment is operating.
Adjustment is completed when the ACTIVE display disappears.
Return the MENU switch from SET to OFF to close the menu.



10 When the lens to be used has an extender, insert an extender and repeat steps 6 to 9.

This completes white shading adjustment.
The adjustment value is stored in the non-volatile memory, so there is no need to readjust the white shading even if the power for the unit is turned off.

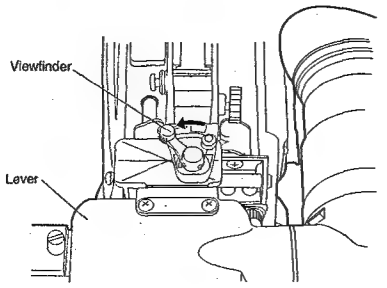
<Notes>

1. The white shading can be adjusted for general lenses using the above method. However, this method may not apply for extremely special lenses.
2. When using a 2/3-inch camera lens, be sure to mount the lens using a conversion adapter. These lenses cannot be mounted directly as their dimensions differ. Attempting to mount these lenses directly may damage the unit.
3. Vertical coloring may occur near the open position of the lens iris even after performing the above adjustments. However, this is characteristic of the optical system of the lens, and does not indicate a malfunction.

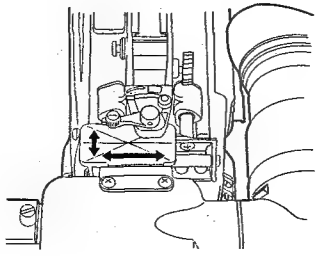
Adjusting the Viewfinder (The viewfinder shown in the illustration is the optional AJ-VF10.)

Adjusting the Position

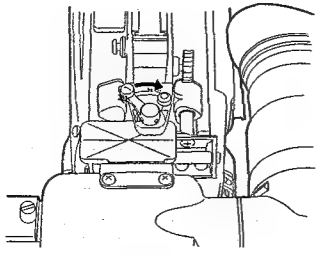
1 Loosen the viewfinder forward-backward/left-right position clamp lever.



2 Adjust the position of the viewfinder in the forward-backward and left-right directions.



3 Tighten the viewfinder forward-backward/left-right position clamp lever to the locked position.



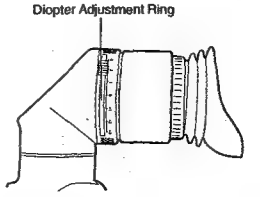
Adjusting the Viewfinder (The viewfinder shown in the illustration is the optional AJ-VF10.)

Adjusting the Diopter and Screen

Adjusting the diopter

1 Set the POWER switch to ON. A picture will appear in the viewfinder.

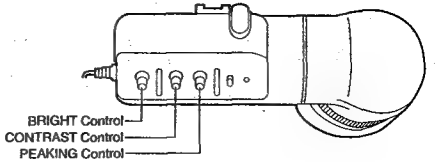
2 Turn the diopter adjustment ring to adjust the diopter so that the viewfinder picture can be clearly seen.



Adjusting the screen

Adjust the condition of the viewfinder screen.

Brightness: Adjust the BRIGHT control
Contrast: Adjust the CONTRAST control
Contour: Adjust the PEAKING control



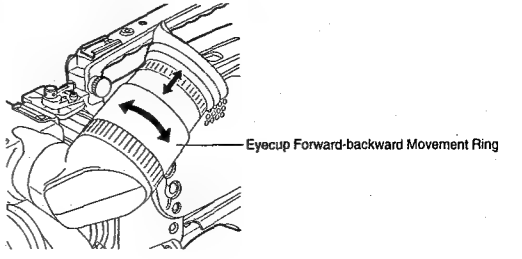
1 Set the POWER switch to ON.

2 Set the OUTPUT switch to CAM.

3 Turn the viewfinder BRIGHT and CONTRAST controls to adjust the picture brightness and contrast. Turning the PEAKING control makes the picture appear softer or sharper. A sharp picture facilitates focusing the lens.

Adjusting the Eyecup Position

Turn the eyecup forward-backward movement ring to adjust the position of the eyecup in the forward-backward direction.



Adjusting the Viewfinder (The viewfinder shown in the illustration is the optional AJ-VF10.)

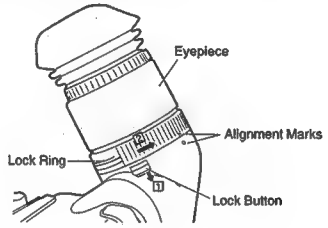
Detaching the Eyecup

Detaching the eyecup allows the entire screen to be seen clearly even when shooting with your eye removed from the viewfinder. This also facilitates the removal of dust which has adhered to the CRT screen and mirror.

<Note>
Absolutely do not wipe the mirror surface as it has been specially treated. Dust which has adhered to the mirror should be blown away with a blower, etc.

1 Press the lock button.

2 Turn the lock ring as far as possible in the counter-clockwise direction and line up the alignment marks on the lock ring and viewfinder barrel.



3 Detach the eyecup.

Remounting the eyecup

1. Line up the alignment marks on the lock ring and the viewfinder barrel, and then insert the eyepiece.
2. Turn the eyepiece as far as possible in the clockwise direction. The lock button latches with a clicking sound, and remounting is completed.

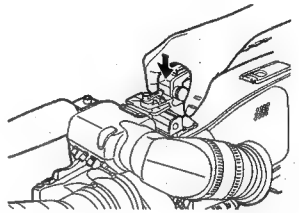
Adjusting the Viewfinder (The viewfinder shown in the illustration is the optional AJ-VF10.)

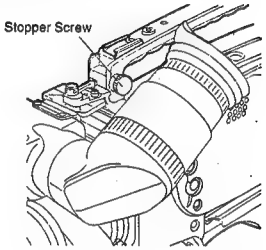
Mounting the Viewfinder

1 Press down the viewfinder.

2 Tighten the viewfinder stopper screw firmly. If it is difficult to insert the screw, press down the viewfinder once again.

3 Connect the plug to the viewfinder connector and secure the viewfinder cable with the clamp.
<Note>
Insert the plug firmly when connecting it to the viewfinder connector.



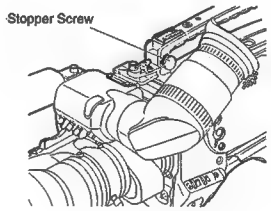


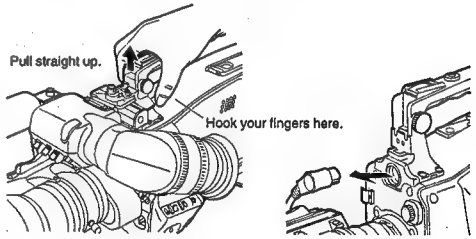
Detaching the Viewfinder

1 Check that the POWER switch is set to OFF.

2 Disconnect the plug from the viewfinder cable connector.
<Note>
Use both hands to detach the viewfinder. The viewfinder may not detach smoothly with one hand, resulting in damage to the viewfinder.

3 Loosen the viewfinder stopper screw and detach the viewfinder by pulling it straight up.





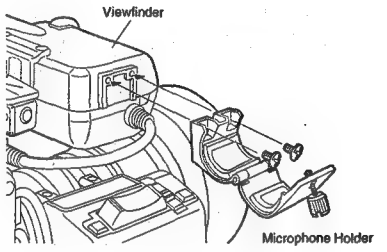
Audio Input Preparations (The viewfinder shown in the illustration is the optional AJ-VF10.)

Using the Microphone Mounted to the Main Unit

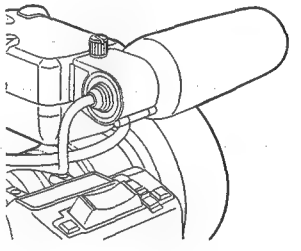
Using the microphone kit (option) or the AJ-MH700P microphone holder (option) allows a microphone to be mounted to the main unit.
•See the Handling Instructions for the microphone holder.

Using the AJ-MC700P Microphone Kit (option) Microphone Mounted to the Main Unit

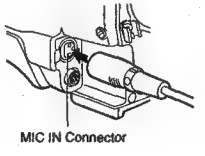
1 Mount the microphone holder.



2 Mount the microphone.



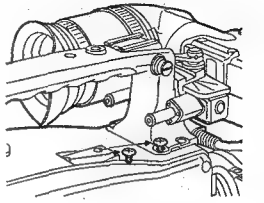
3 Connect the microphone connecting cable to the unit's MIC IN jack.



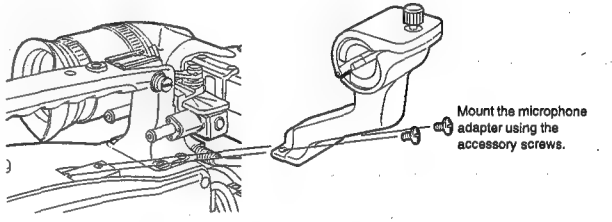
Audio Input Preparations

Mounting the AJ-MH700P Microphone Holder (Option)

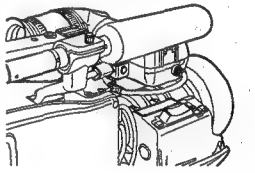
1 Remove the microphone holder mounting screws.



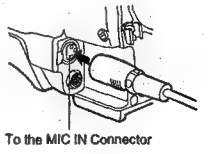
2 Mount the AJ-MH700P microphone adapter (option) to the main unit.



3 Mount the microphone to the microphone holder and tighten the screws.

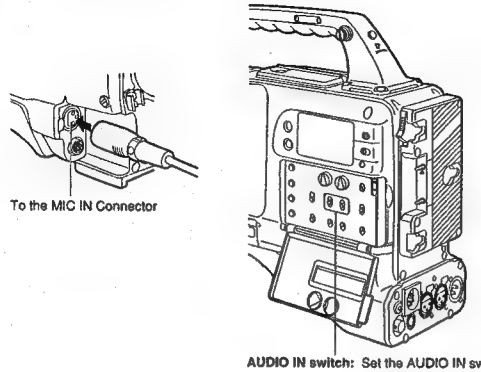


4 Connect the microphone connecting cable to the MIC IN jack.



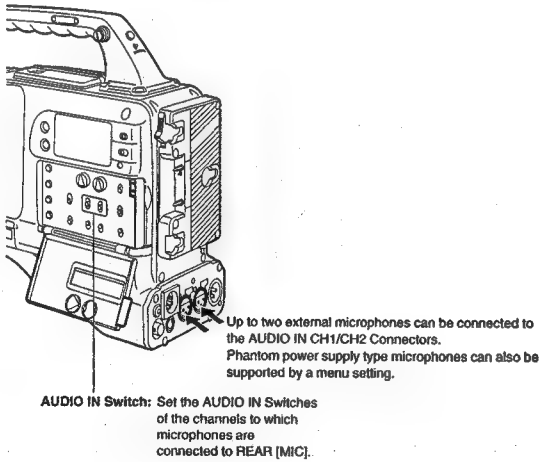
5 Set the AUDIO IN switch to FRONT [MIC] in accordance with the audio channel to be recorded.

Using the Microphone not Mounted to the Main Unit



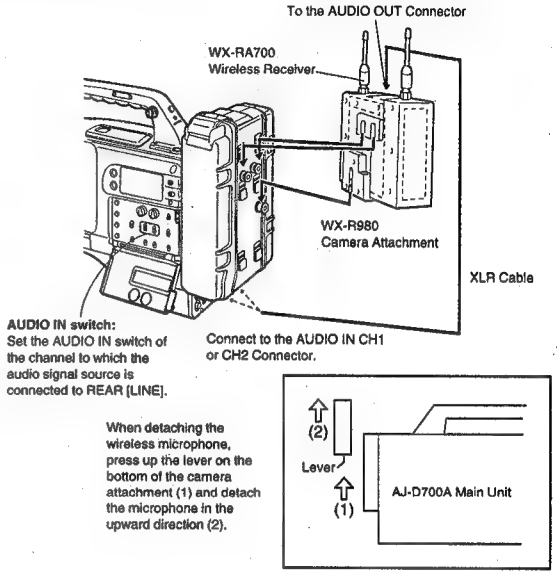
<Note>
When extending the microphone, use a cable which supports the phantom power supply type of microphone.

Using the Microphone not Mounted to the Main Unit



Mounting a Wireless Microphone

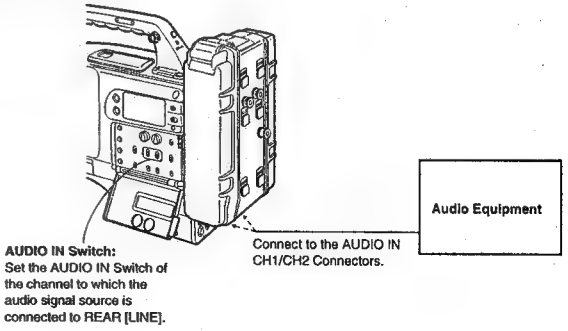
When using the Panasonic wireless microphone system, mount the WX-RA700 wireless receiver.



•See the Handling Instructions for the WX-RA700 wireless receiver for wireless receiver operations.

Connecting an Audio Component

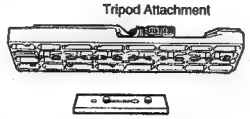
When using an audio component as the line input signal source, connect the audio component to the unit's AUDIO IN CH1/CH2 connectors.



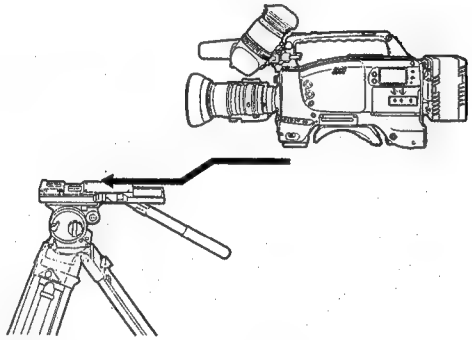
Mounting the Unit to a Tripod

When mounting the unit to a tripod, use an optional tripod attachment.

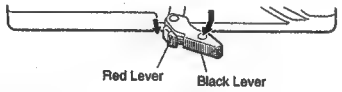
1 Mount the tripod attachment to the tripod.
Select the attachment hole in consideration of the unit's and tripod attachment's center of gravity. In addition, check that the diameter of the selected hole matches the diameter of the universal head's camera mounting screw.



2 Mount the camera to the tripod attachment.
Slide the unit forward along the grooves until a clicking sound is heard.

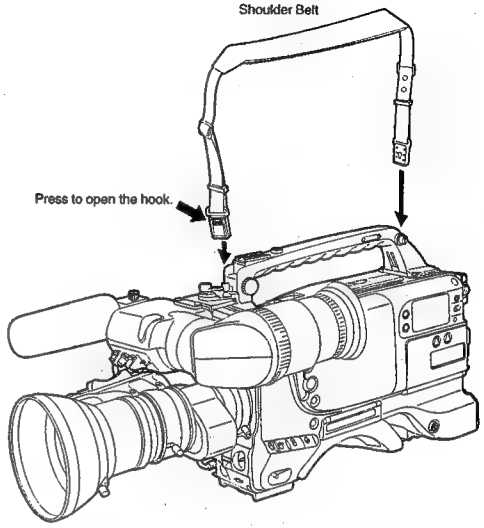


When detaching the tripod attachment
Hold down the red lever and move the black lever in the direction of the arrow.



<Note>
When the tripod attachment pin does not return to its original position after the camera has been detached, hold down the red lever and move the black lever in the direction of the arrow again to return the pin to its original position.
Care should be taken as the camera cannot be mounted if the pin remains in the center.

Mounting the Shoulder Belt



To remove the shoulder belt, open the hooks and then remove the belt.

<Note>
When mounting and removing the shoulder belt, press on the top of the hooks to check that the belt is securely mounted.

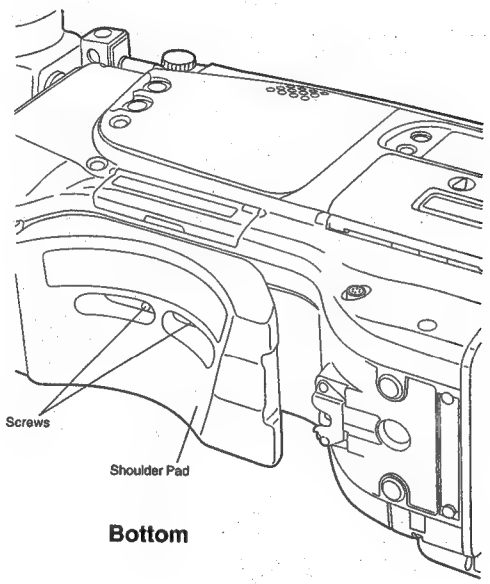
Adjusting the Shoulder Pad Position

The shoulder pad can be slid up to 5/8" in the forward-backward direction from the center position (the position when shipped from the factory). Adjust the shoulder pad position to facilitate operation of the unit.

1 Loosen the two screws.

2 Slide the pad in the forward-backward direction to select an appropriate position.

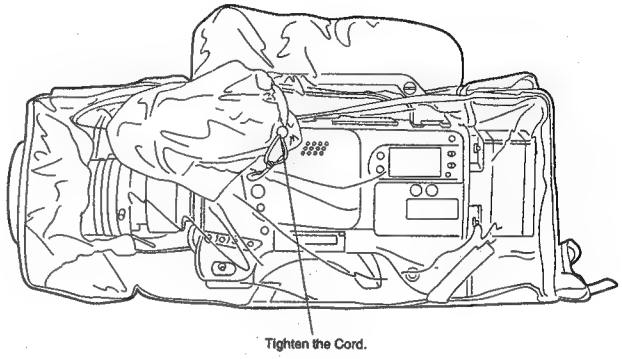
3 Tighten the screws to clamp the pad.

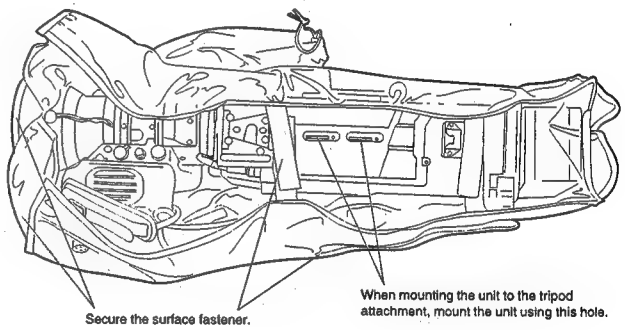


Bottom

Attaching the Rain Cover

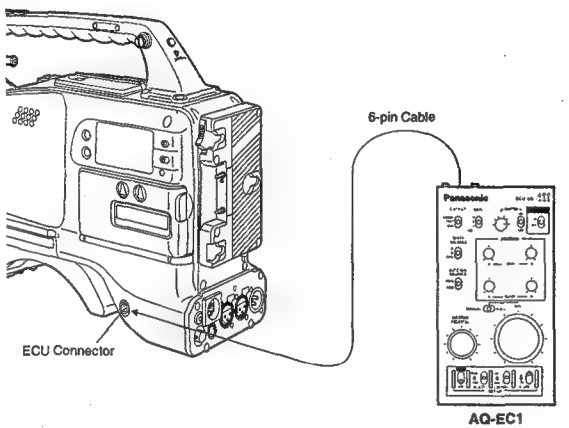
Attach the rain cover as shown in the figure below.





Connecting the AQ-EC1 Extension Control Unit (Option)

Connecting the AQ-EC1 extension control unit (option) allows a portion of the camera section functions to be operated by remote control.
When the AQ-EC1 is connected and the POWER switches of the unit and AQ-EC1 are set to ON, the unit automatically enters remote control mode.
The handling instructions included with the AQ-EC1 describe operations for when the AQ-EC1 is connected to an AQ series digital camera.
When the AQ-EC1 is connected to the AJ-D700A, some functions differ, and some features cannot be used.



<Notes>
- The POWER switches of the unit and AQ-EC1 must be set to OFF before the 6-pin cable is connected or disconnected.
- All adjustments and settings made using the switches and controls other than the menu setting section of the AQ-EC1 are erased when the unit's POWER switch is set to OFF. Also, adjustments and settings made using the AQ-EC1 cannot be written to setup cards. However, when the AQ-EC1 is connected again, these settings return to the AQ-EC1 settings.
  (Menu contents set with the menu setting section are saved.)

<Note>
The functions of the AQ-EC1 are limited as follows.
- The STORE switch does not function.
  (If the menu settings are changed while the AQ-EC1 is connected to the AJ-D700A, the new menu settings are saved automatically as soon as the changes are made.)
  Note that the AQ-EC1 gain switch displays −3, 0 and 9 correspond to L, M and H, and the OUTPUT switch settings CAMERA, TEST and BAR to CAM/AUTO KNEE ON, CAM/AUTO KNEE OFF and BAR for each main unit.
- The Synchro scan and Super V modes cannot be used while the AQ-EC1 is connected to the unit.
- The lens iris (IRIS) control of the AQ-EC1 is valid only when the lens iris AUTO/MANUAL selector is set to AUTO.

Warning/Status Displays in the Viewfinder and Display Window

Displaying the Setting Menu Inside the Viewfinder

When the MENU SET/OFF switch is set to SET, the setting menu appears on the viewfinder screen. The setting menu is displayed in page units. The following table lists all pages contained in the setting menu as well as an outline of the functions for each page.
The setting menu configuration can be changed according to the purpose.

Setting Menu Configuration

Page No.	Page name	Function outline	Reference
57	MARKER	Marker settings	Setting the Marker Displays
55	VF DISPLAY	Selection of viewfinder screen displays	Setting Display Items
58	CAMERA ID	Camera ID display settings	Setting the Camera ID Display
71	SHUTTER SPEED	Shutter speed/mode settings	Setting the Electronic Shutter
72	SYNCHRO SCAN	Synchro scan shutter speed settings	Setting the Electronic Shutter
51	! LED	! lamp display settings	Setting the ! Lamp Display
80	SET UP CARD	Setup card	Setup card operations
106	MAIN FUNCTION	Used function settings	—
106–111	FUNCTION 1/5 to 5/5	Used function settings	Selecting Functions
61	TIME DATE	Time and date settings	Selecting Functions
63	SETTING LOW/MID/HIGH	Camera settings	Selecting Functions
115–119	LEVEL 1/6 to 6/6	Camera settings	Recording Adjustments
120	VF OPERATION	Viewfinder operations	Viewfinder
121	LENS ADJ	Lens adjustments	Lens
121–123	MENU SELECT 1/3 to 3/3	User menu ON/OFF settings	User Menu
124	AUTO SHADING	Automatic shading adjustments	Shading
49 124	DATA RESET	Resetting the setting menu	Returning to the default settings
124	DIAGNOSTIC	—	—

See the corresponding pages for a detailed description of each page's functions.

<Note>
When connecting the AQ-EC1 extension control unit (option) and controlling the AJ-D700A externally, the engineer menu is always opened as the setting menu.

Changing the setting menu configuration

The setting menu can be configured by selecting only the pages necessary for the application.
Pages are selected using the MENU SELECT page of the engineer menu mode.
When using the engineer menu, switch the unit to engineer mode as described below.
The unit is switched to user mode by setting the MENU SET/OFF switch to "SET".
The unit is switched to engineer mode by holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU SET/OFF switch to SET.

The user and engineer modes differ as follows.

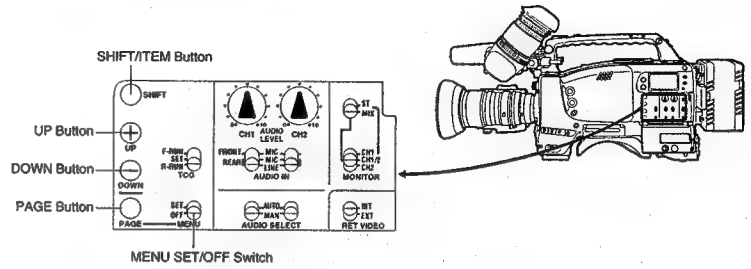
User mode: Only the selected pages the setting menu can be used. The data set on each page is written to the non-volatile memory, allowing it to be stored for extended periods of time.

Engineer mode: All pages contained in the setting menu can be used. In addition, the data set at each page is written to the non-volatile memory, allowing it to be stored for extended periods of time.

After completing the adjustments and settings with engineer mode, configuring a menu consisting only of frequently used pages allows the necessary pages to be called quickly.

Basic Setting Menu Operations

The setting menu is operated using the MENU SET/OFF switch and the SHIFT/ITEM, UP, DOWN and PAGE buttons.



Displaying the setting menu

1 Set the MENU SET/OFF switch to SET.
The status displays at the top and bottom of the viewfinder screen disappear, and the page on which the previous setting menu operations were completed appears.
When the menu is used for the first time, the first of the selected pages appears.

```
- MARKER -

CENTER MARK : ON
SAFETY ZONE : 1
```

Changing the page

1 Press the PAGE button.
The menu page changes each time the PAGE button is pressed.

```
- 1LED -

GAIN(0dB)
GAIN(-3dB)
SHUTTER
WHITE PRESET
EXTENDER
FILTER
SUPER V
```

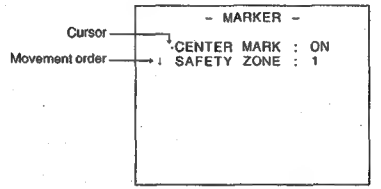
The page can also be changed using the UP and DOWN buttons as follows.

- **PAGE+UP:** The menu page is incremented continuously while the UP and PAGE buttons are held down.
- **PAGE+DOWN:** The menu page is decremented continuously while the DOWN and PAGE buttons are held down.

Warning/Status Displays in the Viewfinder and Display Window

Selecting the desired item

1 Press the SHIFT/ITEM button.
Each time this button is pressed, the cursor (arrow) which indicates the selected item moves to the next item.

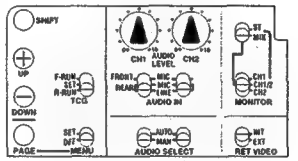


The item can also be selected using the UP and DOWN buttons as follows.

Changing the settings

Press the UP button to increase the setting.
- The setting is incremented by 1 level each time the UP button is pressed.

Press the DOWN button to decrease the setting.
- The setting is decremented by 1 level each time the DOWN button is pressed.



Changing the ON/OFF selection

The setting switches to ON or OFF each time the UP (or DOWN) button is pressed.

Returning to the default settings

The unit can be returned to the default settings (the settings when shipped from the factory or the engineer mode settings) by pressing the UP (or DOWN) button at the DATA RESET page of engineer mode*.
However, care should be taken as the flare and shading adjustment values cannot be returned to the default settings.

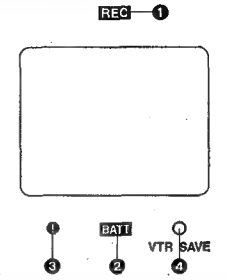
Quitting the menu

Set the MENU SET/OFF switch to OFF.
- The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

***Engineer mode**
The menu for this mode is opened by holding down the SHIFT/ITEM and UP buttons simultaneously and then setting the MENU SET/OFF switch to the "SET" position.

Lamp Displays Inside the Viewfinder

The viewfinder displays are as follows.
(optional AJ-VF10)



1. **REC (recording) lamp**
This lamp lights (red) during recording, and flashes when warnings are issued.
•See "Warning System" (page 125) for a detailed description.

2. **BATT (battery) lamp**
When the battery voltage has dropped, this lamp begins flashing several minutes before the unit can no longer be operated, and lights when the unit can no longer be operated.
To prevent operation from being interrupted, exchange the battery quickly before the battery runs out.

3. **! (irregular operation status warning) lamp**
This lamp lights when the unit enters irregular operation status for any of the items set to ON at the ! LED page of the setting menu. Applicable items are as follows.

Setting item	Setting contents
Gain (0 dB)	The gain is set to a value other than 0 dB.
Gain (−3 dB)	The gain is set to a value other than −3 dB.
SHUTTER switch	The switch is set to ON.
WHITE PRESET switch	The switch is set to PRESET.
Lens extender	The lens extender is being used.
Filter control	The control is set to a value other than 1.
SUPER V switch	The switch is set to ON.

•See "Setting the ! Lamp Display" (next page) for selecting ! lamp display items.

4. **VTR SAVE (VTR power saving) lamp**
This lamp lights when the VTR SAVE/STBY switch is set to SAVE. It is not lighted during recording.

<Note>
Regardless of the VTR SAVE/STBY switch, the unit automatically enters the SAVE state and the lamp lights either after two minutes when in the stopped state, or after the length of time set for the pause timer (the pause time) when in the paused state.

Lamp Displays Inside the Viewfinder

Setting the ! Lamp Display

Items subject to ! lamp display are selected at the ! LED page of the setting menu. (When shipped from the factory, the unit is set so that the ! LED page is not displayed.) To operate the ! LED page, switch the unit to engineer mode or select the ! LED page at the MENU SELECT page.

- See "Setting Menu Configuration" (page 46) for engineer mode and selection of displayed pages.

1 Set the MENU SET/OFF switch to SET.
The setting status displays disappear from the viewfinder screen, and the page on which the previous setting menu operations were completed appears. (When the menu is used for the first time, the first page appears.)

2 Press the PAGE button until the ! LED page shown below appears. (This operation can also be performed using the PAGE+UP/DOWN buttons.)

```
- !LED -

 ·•GAIN(0dB)
  ·GAIN(-3dB)
  •SHUTTER
  ·WHITE PRESET
  •EXTENDER
  ·FILTER
  ·SUPER V
```

<Note>
•: ON
·: OFF

→•**GAIN (0 dB):** This selects whether or not the ! lamp lights when the gain is set to any value other than 0 dB.
·**GAIN (−3 dB):** This selects whether or not the ! lamp lights when the gain is set to any value other than −3 dB.
•**SHUTTER:** This selects whether or not the ! lamp lights when the SHUTTER switch is set to ON.
·**WHITE PRESET:** This selects whether or not the ! lamp lights when the white balance memory channel is PRST.
•**EXTENDER:** This selects whether or not the ! lamp lights when the lens is in EXTENDER mode.
·**FILTER:** This selects whether or not the ! lamp lights when the filter is set to any value other than 3200K.
·**SUPER V:** This selects whether or not the ! lamp lights when SUPER V is set to ON.

3 Repeatedly press the SHIFT/ITEM button to move the cursor to the position of the desired item.

4 Press the UP and DOWN buttons to choose ! lamp lighted/not lighted for the selected item.
To select ON: Press the UP button. An asterix (•) appears to the left of the item name.
To select OFF: Press the DOWN button. A period (·) appears to the left of the item name.

Repeat steps 3 and 4 to continue making ON/OFF settings for other items.

5 When menu operations have been completed, set the MENU SET/OFF switch to OFF.
The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

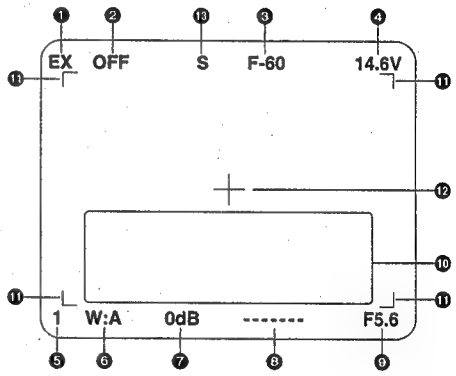
Status Displays Inside the Viewfinder Screen

In addition to images, messages indicating the unit's settings and operating status appear on the viewfinder screen. The center marker and safety zone marker, etc. are also displayed.
When the MENU SET/OFF switch is set to OFF, items set to SET at the VF DISPLAY page of the setting menu and using related switches appear at the top and bottom of the screen.
Messages informing of the setting contents or of the adjustment course or results can also be displayed for approximately 3 seconds when settings are changed, during the course of adjustments, or after adjustments have been completed.

- See "Selecting Display Items" (page 55) for selecting display items, "Display Mode and Setting Change Message" (page 56) for the setting change message, and "Setting the Marker Displays" (page 57) for the marker displays.

The display positions of all items which can be displayed are shown in the figure below.

1. Extender display
2. Shutter speed/mode display
3. Remaining tape length display
4. Remaining battery level display
5. Filter display
6. White balance memory display
7. Gain value display
8. Audio level display
9. Iris value display
10. Warning display
11. Safety zone marker
12. Center marker
13. Super iris ON display



Status Displays Inside the Viewfinder Screen

1 **Extender display**
This is displayed when the lens extender is being used.

2 **Shutter speed/mode display**
This displays the shutter speed or shutter mode setting.
OFF: The shutter is not used.
1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000:
Shutter speeds (seconds) during standard mode.
1/30.4–1/250 (SYNCHRO SCAN):
Synchro scan mode is selected.
SUPER V: High vertical resolution mode is selected.

3 **Remaining tape length display**
This indicates the remaining tape length (minutes) for the VTR during recording.

Remaining tape length display

Display	Remaining tape length
F–60	Full to 60 minutes
60–55	60 to 55 minutes
55–50	55 to 50 minutes
50–45	50 to 45 minutes
45–40	45 to 40 minutes
40–35	40 to 35 minutes
35–30	35 to 30 minutes
30–25	30 to 25 minutes
25–20	25 to 20 minutes
20–15	20 to 15 minutes
15–10	15 to 10 minutes
10–5	10 to 5 minutes
5–0	5 to 0 minutes

The "5–0" display flashes when there is less than 3 minutes of tape remaining.

4 **Remaining battery level display**
When an Anton Bauer Digital Magnum Series battery is used to supply power to the unit, the remaining battery level is displayed numerically (%).

5 **Filter display**
This displays the type of filter selected.

6 **White balance memory display**
This displays the selected white balance automatic adjustment memory.
A: The WHITE BAL switch is set to A.
B: The WHITE BAL switch is set to B.
P: The WHITE BAL switch is set to PRST.

7 **Gain value display**
This displays the image amplifier gain setting (dB) set by the GAIN switch.

<Note>
When using an Anton Bauer Digital Magnum Series battery, the remaining battery level display continues to display the level for the Anton Bauer battery even if power supply is switched to an external power source near the end of the battery's power. However, note that the unit operates according to the external power source.

Status Displays Inside the Viewfinder Screen

8 **Audio level display**
This displays the audio CH1 level.
During sine wave input, the audio level display corresponds roughly to the VTR level meter display as follows.

Audio Channel 1 Level Display	▬	▬	▬	■	▬	▬	*
VTR Level Meter	-40	-30	-25	-20	-15	-8	0

9 **Iris value display**
This displays the approximate iris setting (F number).

10 **Warning display**
This displays the black balance, white balance, auto knee function, super iris, super high gain and other warning displays.

11 **Safety zone marker**
This indicates the 80% or 90% (setting when shipped from the factory) range for the viewfinder screen area. The screen area percentage is selected at the MARKER page of the setting menu.
●See "Setting the Marker Displays" (page 56) for a detailed description.

12 **Center marker**
This indicates the center of the viewfinder screen. This marker is displayed when set to ON at the MARKER page of the setting menu.

13 **Super Iris ON display**
This indicates that the super iris is ON.

1) Iris value display
The iris value is displayed when using a lens with the iris value display function.

Selecting Display Items

The items to be displayed on the viewfinder screen can be selected by switching the display ON/OFF setting independently for each item at the VF DISPLAY page. The items which can be selected are as follows.

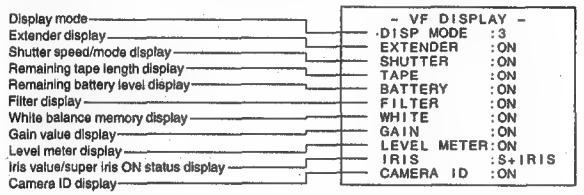
- Display mode (See "Display Mode and Setting Change/Adjustment Course Message".)
- Extender display
- Shutter speed/mode display
- Remaining tape length display
- Remaining battery level display
- Filter display
- White balance memory display
- Gain value display
- Level meter display
- Iris value/super iris ON status display
- Camera ID display

- The camera ID is displayed when recording the color bar according to the OUTPUT/AUTO KNEE switch setting. See "Setting the Camera ID" (page 58) for a detailed description.

Select the items to be displayed on the viewfinder screen.

1 Set the MENU SET/OFF switch to SET.
The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first page appears.)

2 Press the PAGE button until the VF DISPLAY page shown below appears.
(This operation can also be performed using the PAGE+UP/DOWN function.)



3 Press the SHIFT/ITEM button to move the cursor to the position of the desired item.

4 Press the UP and DOWN buttons to choose whether to display (ON) or not display (OFF) the selected item on the viewfinder screen.
The setting switches to ON or OFF each time the UP (or DOWN) button is pressed.
Repeat steps 3 and 4 when setting display ON/OFF for other items.

5 When menu operations have been completed, set the MENU SET/OFF switch to OFF.
The setting menu disappears from the viewfinder screen and the displays indicating the settings of the selected items appear.

Display Mode and Setting Change Message

Messages informing of the contents of changed settings and adjustment results can be limited to part of the displayed items or not displayed for all items.
The conditions under which messages are displayed and the corresponding display modes are shown in the table below.

Setting change/adjustment results messages and display modes

Conditions under which messages are displayed	Message	Display mode setting		
		1	2	3
When the filter selection is changed.	ND: n (n=1, 2, 3, 4)	×	×	○
When the gain setting is changed.	GAIN: n dB (n=−3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 30)	×	×	○
When the WHITE BAL switch setting is changed.	WHITE: n (n=ACH, BCH, PRESET)	×	×	○
When the OUTPUT/AUTO KNEE switch is set to AUTO KNEE or OFF*)	AUTO KNEE: ON (or OFF)	×	○	○
When the shutter speed/mode setting is changed.	SS: 1/100 (or 1/120, 1/250, 1/500, 1/1000,1/2000, S. SCAN, SUPER V)	×	○	○
When the white balance is adjusted (AWB)	Ex.) AWB: OK •See "Adjusting the White Balance" (page 65) for a detailed description.	×	○	○
When the black balance is adjusted (ABB)	Ex.) ABB: OK •See "Adjusting the Black Balance" (page 68) for a detailed description.	×	○	○

○: Message displayed
×: Message not displayed

*) The message is displayed for approximately 3 seconds immediately after the power for the unit is turned on.

Changing the Display Mode

The display mode setting appears on the VF DISPLAY page of the setting menu.

1 Perform the operations in steps 1 to 3 of "Selecting Display Items" (page 55) to display the VF DISPLAY page of the setting menu on the viewfinder screen and align the cursor with the DISP MODE item.

2 Press the UP or DOWN button to select the desired display mode.

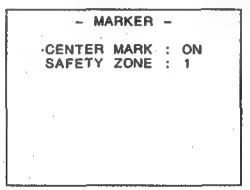
3 When menu operations have been completed, set the MENU SET/OFF switch to OFF.

Setting the Marker Displays

Display ON/OFF switching for the center and safety zone markers and selection of 80% or 90% of the screen area as the safety marker range are performed at the MARKER page of the setting menu.

1 Set the MENU SET/OFF switch to SET.
The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first page appears.)

2 Press the PAGE button until the MARKER page shown below appears.
(This operation can also be performed using the PAGE+UP/DOWN function.)



3 Press the SHIFT/ITEM button to move the cursor to the position of the desired item.

4 The setting switches to ON or OFF each time the UP (or DOWN) button is pressed.

5 When menu operations have been completed, set the MENU SET/OFF switch to OFF.
The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

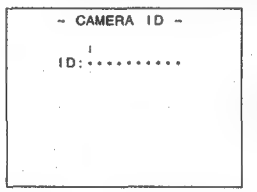
Setting the Camera ID

The camera ID can be set at the CAMERA ID page of the setting menu.
A camera ID of up to ten characters including English letters, symbols and spaces can be used.
The camera ID is recorded when the OUTPUT/AUTO KNEE switch is set to BARS and the color bar signal is being recorded. It is also displayed on the viewfinder screen.

<Note>
When the setting menu is displayed, the camera ID is not displayed even if the color bar signal is output.

1 Set the MENU SET/OFF switch to SET.
The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first page appears.)

2 Press the PAGE button until the CAMERA ID page shown below appears.
(This operation can also be performed using the PAGE+UP/DOWN function.)



: The cursor is moved to the right (max. 10 spaces) by the SHIFT/ITEM button.
: English letters, symbols and space are switched by the UP and DOWN buttons.

Camera ID
("*" indicates a space. This indication is only used at this menu page.)

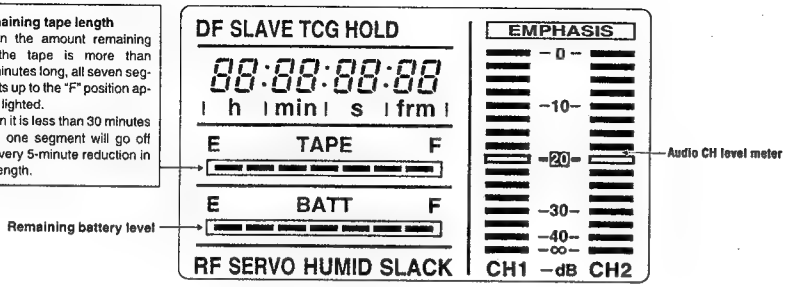
3 Press the UP (or DOWN) button until the desired character appears.
Each time the UP button is pressed, the character display changes in the order of English letters (A to Z)→numbers (0 to 9)→symbols [space, >, <,), (, ', ', -, _, ~, /, !]. Pressing the DOWN button changes the character display in the reverse order.

4 Press the SHIFT/ITEM button to advance the cursor to the next position and return to step 3 to set the characters.

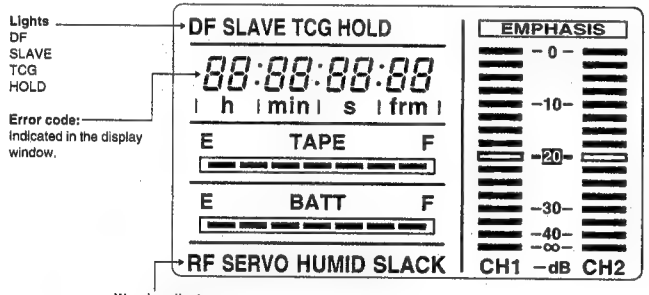
5 When menu operations have been completed, set the MENU SET/OFF switch to OFF.
The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

Remaining Battery Level and Audio Level Displays

Remaining tape length
When the amount remaining on the tape is more than 30 minutes long, all seven segments up to the "F" position appear lighted.
When it is less than 30 minutes long, one segment will go off for every 5-minute reduction in the length.



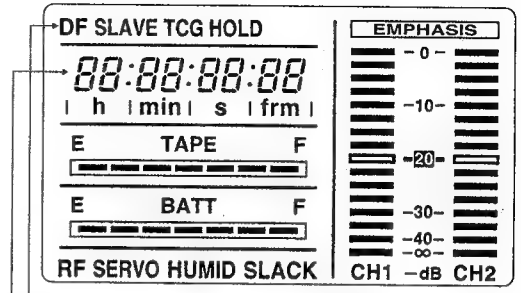
VTR Section Operation/Status-Related Displays



RF: Lights when video head clogging occurs.
SERVO: Lights when the servo is out of order.
HUMID: Lights when condensation occurs on the head drum.
SLACK: Lights when tape wind-up trouble occurs.

●See "Warning System" (page 125) for a detailed description.

Time Code-Related Displays



These lamps light to indicate the time code, CTL and real time displays.
DF: This lamp lights during drop frame mode
SLAVE: This lamp lights when the time code is locked to an external source.
HOLD: This lamp lights when the time code generator is held (when the HOLD button is pressed).

Time counter display: This displays the time code, CTL, user bit and real time.
●See below for the relationship between displayed items and switch settings.

Relationship between the TCG and DISPLAY switch setting positions and the time counter display
The item displayed in the time counter display is determined by the TCG switch and DISPLAY switch settings.

Time code-related switch settings and display items

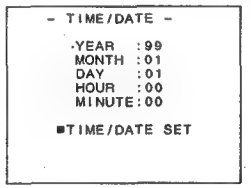
TCG switch position	DISPLAY switch position	Displayed item
SET	TC or CTL	Time code
	UB	User bit
F-RUN or R-RUN	CTL	CTL
	TC	Time code
	UB	User bit

Adjusting the Time and Date

Adjustment and setup using the setting menu

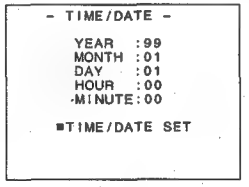
1 Hold down the SHIFT/ITEM and UP buttons and set the MENU SET/OFF switch to SET. The unit switches to ENG mode.
The page on which the previous setting menu operations were completed appears on the viewfinder screen.
(When the menu is used for the first time, the first page appears.)

2 Press the PAGE button until the TIME/DATE page shown below appears.
(This operation can also be performed using the PAGE+UP/DOWN function.)



3 Press the SHIFT/ITEM button to select the item to be changed.

4 Press the UP (or DOWN) button to change the setting value.
The number is incremented by +1 each time the UP button is pressed and decremented by −1 each time the DOWN button is pressed.



5 When the settings have been completed, press the SHIFT/ITEM button to select TIME/DATE SET and then press the UP (or DOWN) button. The time starts from when the button is pressed.

6 When menu operations have been completed, set the MENU SET/OFF switch to OFF.
The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

<Note>
The seconds cannot be set and always start from 0 seconds.

Adjustments and Setup During Recording

Adjustments and Setup Using the Setting Menu

Adjustments and setup operations during recording are performed at the setting menu.
Setting menu operations are basically performed according to the procedures described on page 48.
However, these procedures vary slightly according to the item.
Items which can be adjusted or set up at the setting menu are as follows.

Adjustment/setup items at the setting menu

Adjustment/setup item	Page name	Operation reference
Setting the gain selector value	SETTING (LOW/MID/HIGH)	Setting the Gain Selector Value, Setting the DTL and gamma, etc.
Selecting the shutter speed/ mode to be used	SHUTTER SPEED	Setting the Electronic Shutter
Setting the synchro scan mode shutter speed	SYNCHRO SCAN	Setting the Electronic Shutter
Selecting required functions	FUNCTION 1/5 to 5/5	Selecting Functions
Shading adjustment	AUTO SHADING	Shading Adjustment
Setup card data operations	SET UP CARD	Setup Card Operations

Setting the Gain Selector Value

When shooting in locations without sufficient brightness, bright images can be obtained by raising the gain. However, care should be taken as raising the gain also increases the noise.

The gain value for the image amplifier is selected by the GAIN switch. The gain values corresponding to the L, M and H positions of the GAIN switch are set at the MASTER GAIN page of the setting menu.

Setting the gain selector value

1 Set the MENU SET/OFF switch to SET.
The page on which the previous setting menu operations were completed appears on the viewfinder screen.
(When the menu is used for the first time, the first page appears.)

2 Press the PAGE button to display the SETTING (LOW/MID/HIGH) page shown below.
(This operation can also be performed using the PAGE+UP/DOWN function.)

```
- LOW  SETTING -

·MASTER GAIN   : 0dB
 H.DTL LEVEL   :13
 V.DTL LEVEL   :10
 DTL CORING    :08
 H.DTL FREQ.   :03
 DARK DTL      :00
 LEVEL DEPEND  :03
 MASTER GAMMA  :0.60
 BLACK STRETCH:OFF
 MATRIX TABLE  :A
```

3 Press the SHIFT/ITEM button repeatedly to move the cursor to the MASTER GAIN position.

4 Press the UP or DOWN button to set the gain value.
The gain value can be set freely regardless of size from among −3, 0, 3, 6, 9, 12, 15, 18, 21, 24 and 30 dB.
When resetting the gain values to the settings when shipped from the factory (LOW=0 dB, MID=9 dB, HIGH=18 dB), select MENU INIT. at the DATA RESET page of the setting menu and press the UP or DOWN button.

5 When menu operations have been completed, set the MENU SET/OFF switch to OFF.
The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

Selecting Functions

VTR operation functions can be selected at the FUNCTION 3/5 page of the setting menu.

Selecting the required functions

1 Set the MENU SET/OFF switch to SET.
The page on which the previous setting menu operations were completed appears on the viewfinder screen.
(When the menu is used for the first time, the first page appears.)

2 Press the PAGE button to display the FUNCTION 3/5 page.
(This operation can also be performed using the PAGE+UP/DOWN function.)

```
- FUNCTION 3/5 -

·HUMID OPE     :OFF
 26P CONTROL   :OFF
 REC START     :NORMAL
 TC MODE       :DF
 UB MODE       :USER
 PAUSE TIMER   :30
 BATTERY SEL   :NiCd12
 TCG VF DISP   :OFF
 TCG SET HOLD  :OFF
 FIRST REC TC  :REGEN
```

3 Press the SHIFT/ITEM button to move the cursor to the position of the function to be changed.

4 Press the UP (or DOWN) button to change the setting of the selected function.
If settings for other functions are also to be changed, return to step 3.

5 When menu operations have been completed, set the MENU SET/OFF switch to OFF.
The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

Adjusting the White Balance

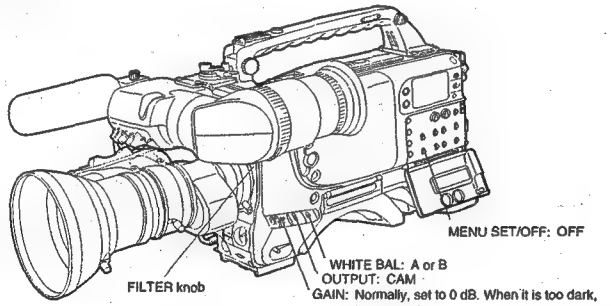
Adjusting the white balance and black balance in the order of AWB (white balance adjustment)→ABB (black balance adjustment)→AWB will provide a better picture.
Normally, the white balance and black balance do not need to be readjusted even if the power is turned off and then on again.
However, the white balance must be readjusted when the lighting conditions change.
If black balance and white balance adjustments are started when the display mode is set to "2" or "3", messages informing of the adjustment course and results will appear on the viewfinder screen. Set the display mode to "1" to not display these messages.

- See "Display Mode and Setting Change Message" (page 56) for a description of setting the display mode.

<Notes>

- The white balance and black balance cannot be adjusted while the setting menu appears on the viewfinder screen. Therefore, be sure to set the MENU SET/OFF switch to OFF.
- ABB must be executed again when the MASTER GAIN values on the LOW SETTING, MID SETTING and HIGH SETTING pages of the setting menu are changed, the S IRIS SW item is set to +30 dB at the FUNCTION 2/5 page of the setting menu, or the GAMMA (ON/OFF) item is switched at the FUNCTION 1/5 page of the setting menu.
- With artificial lights, particularly with fluorescent lights and mercury-arc lamps, the strength of the R, G and B colors changes in synchronization with the power line frequency even if the brightness of these lights appears to be constant. Especially in areas where the power line frequency is 50 Hz, the vertical synchronizing frequency (approx. 60 Hz) of the TV and the frequency (50 Hz) of the lighting tend to interact. This gives rise to flicker and to a phenomenon where the hue changes along with the passage of time, and it is it impossible to obtain the proper white balance.
  These phenomena can be reduced by setting the shutter speed to 1/100. For this reason, wherever the unit is used under fluorescent or mercury-arc lamps and at a frequency of 50 Hz, the shutter speed must be set to 1/100 and the white balance obtained. This shutter speed of 1/100 should also be used during shooting.

1 Set the switches as shown in the figure.

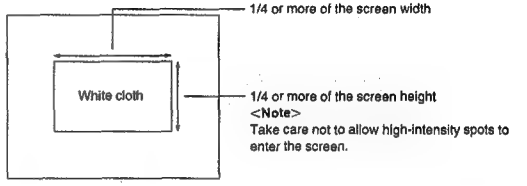


If the settings of the GAIN and WHITE BAL switches are changed, a message informing of the new setting will appear for about 3 seconds at the setting change message display position on the viewfinder screen. (However, the message appears only when the display mode is set to "3".)

2 Select the FILTER knob setting in accordance with the lighting conditions.

- See FILTER knob (page 15) in the Shooting (Recording)/Playback Function Section for examples of FILTER knob settings. If the setting of the FILTER knob is changed, a message informing of the new setting will appear for about 3 seconds at the setting change message display position on the viewfinder screen. (However, the message appears only when the display mode is set to "3".)

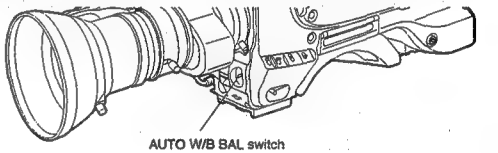
3 Place the white pattern over a location with the same conditions as the light source illuminating the subject and zoom up to project white on the screen.
A white object (white cloth, white wall) near the subject can also be used. The white area required is as shown below.



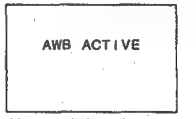
<Note>
Take care not to allow high-intensity spots to enter the screen.

4 Adjust the iris of the lens.

5 Press the AUTO W/B BAL switch to the WHT side and release the switch.
The switch returns to the center and the white balance is automatically adjusted.

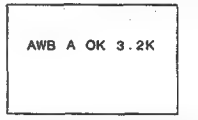


6 During the adjustment, the following message appears on the viewfinder screen. (However, the message appears only when the display mode is set to "2" or "3".)



Message during adjustment

7 Adjustment is completed after approximately 1 second (the following message appears) and the adjustment value is automatically stored in the memory (A or B) selected in step 1.



Message after adjustment is completed

<Note>
If a lens equipped with the automatic iris function is used, the iris may experience hunting1). In these cases, adjust the iris gain knob (the knob marked IG, IS, S, etc.) on the lens.

- See the Handling Instructions for the lens for a detailed description.

1) **Hunting:** The auto iris responds repeatedly causing the image to become darker and brighter.

When the White Balance Cannot be Automatically Adjusted

An error message will appear on the viewfinder screen.
(The message appears when the display mode is set to "2" or "3".)
The displayed messages are as follows.

Error messages related to white balance adjustment

Error message	Meaning	Treatment
COLOR TEMP. HIGH	The color temperature is too high.	Select an appropriate filter
COLOR TEMP. LOW	The color temperature is too low.	Select an appropriate filter.
LOW LIGHT	There is insufficient illumination.	Increase the illumination or gain.
LEVEL OVER	There is too much illumination.	Decrease the illumination or gain.

If the above error messages appear, carry out the respective treatment attempt to adjust the white balance again.
If the error message continues to appear even after repeated attempts, consult your dealer.

<Note>
The white balance cannot be adjusted while the setting menu is displayed on the viewfinder screen. Therefore, be sure to set the MENU SET/OFF switch to OFF.

When there is no Time to Adjust the White Balance

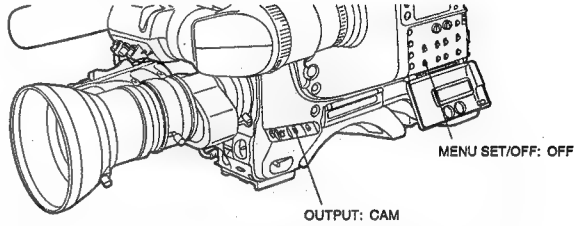
Set the WHITE BAL switch to PRST.
The white balance for the filter is automatically adjusted according to the setting position of the FILTER knob (outside).

White balance memories
The white balance has two memory systems: A and B.
Adjustment values for each filter can automatically be stored in the memory corresponding to the setting (A or B) of the WHITE BAL switch. The unit contains 4 filters, making a total of 8 (4×2) adjustment values which can be stored.
If FILTER INH on the FUNCTION 2/5 page of the setting menu is set to ON, the A and B systems can be limited to one memory each.
In this case, the memory contents are not linked to the filters.

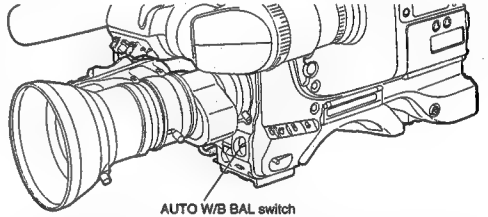
The black balance must be adjusted in the following cases.
- When the unit is used for the first time
- When the unit is first used after an extended period of non-use
- When the unit is used under conditions where the ambient temperature has changed by a wide margin
- When the gain selector value is changed
- When the SUPER IRIS button setting is changed (when setting is changed to +30 dB)
- When the gamma ON/OFF is changed

Adjusting the Black Balance

1 Set the switches as shown in the figure.



2 Press the AUTO W/B BAL switch to the ABB side and then release the switch.
The switch returns to the center and the black balance is automatically adjusted.



3 During the adjustment, the following message will appear on the viewfinder screen. (However, the message appears only when the display mode is set to "2" or "3".)

Message during adjustment

- The lens iris automatically goes to the "CLOSE" position during the adjustment.

Adjusting the White Balance/Black Balance

4 Adjustment is completed after a few seconds (the following message appears) and the adjustment value is automatically stored in the memory.

Message after adjustment is completed

<Notes>
- Check that the lens connector is connected and that the iris of the lens is set to CLOSE.
- During black balance adjustment, the iris automatically goes to the shaded status.
- During black balance adjustment, the gain selector circuit switches automatically. In addition, flicker and noise may appear on the viewfinder screen, but this does not indicate a malfunction.
- The black balance cannot be adjusted while the setting menu is displayed on the viewfinder screen. Therefore, be sure to set the MENU SET/OFF switch to OFF.
- If black shading is not satisfactory even when ABB is OK, open the AUTO SHADING page of the setting menu and execute black shading adjustment. (See page 124.)

Setting the Electronic Shutter

Shutter Modes

The shutter modes which can be used with the unit's electronic shutter and the shutter speeds which can be selected are as follows.

Shutter modes and shutter speeds which can be selected

Mode	Shutter speed	Application
Standard	1/100, 1/120, 1/250, 1/500, 1/1000 and 1/2000 (seconds)	This mode is used to shoot clear images of quickly moving subjects.
SYNCHRO SCAN	248 steps in the range from 30.4 Hz to 250 Hz	This mode is used to reduce horizontal stripe patterns for monitor screens with a vertical scanning frequency of 30 Hz or more.
SUPER V		This mode is used to increase the vertical resolution.

<Notes>
- Increasing the shutter speed lowers the camera sensitivity regardless of electronic shutter mode.
- If the iris is set to AUTO, the iris opens and the depth of the focuses decreases as the shutter speed rises.

Setting the Electronic Shutter

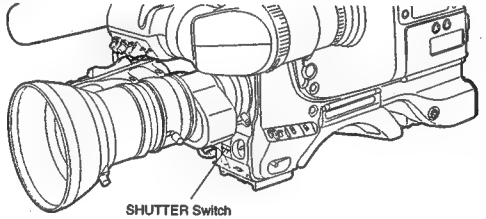
Setting the Shutter Mode/Speed

- The shutter speed during shutter mode and standard mode is set by the SHUTTER switch.
- During SYNCHRO SCAN mode, the shutter speed can be set beforehand at the SYNCHRO SCAN page of the setting menu. The shutter speed can also be set by the UP and DOWN buttons during SYNCHRO SCAN mode. (In addition, if S. SCAN SEL on the FUNCTION 2/5 page of the setting menu is set to ON, the shutter speed can also be varied by the SUPER IRIS and MODE CHECK switches on the side panel. However, note that the SUPER IRIS and MODE CHECK functions do not operate at this time.)
- The shutter speed selection range can be limited to the required range and whether to use special operation modes (SYNCHRO SCAN or SUPER V) can be selected at the SHUTTER SPEED page of the setting menu.

1 Perform the operations outlined in "Changing the Display Mode" (page 57) and set the display mode to "2" or "3" at the VF DISPLAY page of the setting menu.

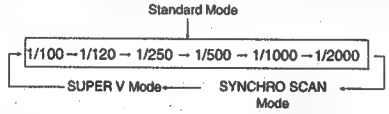
2 Press the SHUTTER switch from the ON position to the SEL side. The current shutter setting appears in the setting change message display position on the viewfinder screen.

Ex.: 1/120, 1/61.7, etc.



SHUTTER Switch

3 Press the SHUTTER switch to the SEL side repeatedly until the desired mode or speed appears. When all modes and speeds can be displayed, the display changes in the order shown below. If the required shutter speeds and modes have been designated beforehand, only the designated speeds or modes appear.



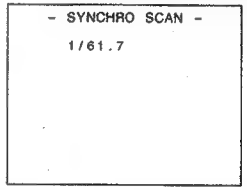
- When the unit is shipped from the factory, SUPER V mode is not specified and is therefore not displayed.

Setting the Electronic Shutter

Setting the Synchro Scan Mode

1 Set the MENU SET/OFF switch to SET.
The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first page appears.)

2 Press the PAGE button repeatedly until the SYNCHRO SCAN page shown below appears. (This operation can also be performed using the PAGE+UP/DOWN function.)



3 Press the UP (the value increases) or DOWN (the value decreases) button repeatedly to display the desired frequency. The frequency can be switched continuously within the range of 30.4 Hz to 250.0 Hz.

4 When menu operations have been completed, set the MENU SET/OFF switch to OFF. The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.
(If S. SCAN MODE SEL on the FUNCTION 2/5 page of the setting menu is set to ON, the shutter speed can be varied by the SUPER IRIS and MODE CHECK switches. However, care should be taken at this time as the SUPER IRIS and MODE CHECK functions cannot be operated only during SYNCHRO SCAN mode.)

Setting the Electronic Shutter

Changing the Shutter Speed/Mode Selection Range

The shutter speed selection range can be limited to the required range and whether to use a special operation mode can be selected at the SHUTTER SPEED page of the setting menu. The unit is set so that the SHUTTER SPEED page is not displayed when shipped from the factory. To operate the SHUTTER SPEED page, switch the unit to engineer mode or select the SHUTTER SPEED page at the MENU SELECT page beforehand.

1 Set the MENU SET/OFF switch to SET.
The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first page appears.)

2 Press the PAGE button repeatedly until the SHUTTER SPEED page shown below appears. (This operation can also be performed using the PAGE+UP/DOWN function.)

```
- SHUTTER SPEED -

 ·SYNCHRO SCAN
 ·SUPER V
 ·1/100
 ·1/120
 ·1/250
 ·1/500
 ·1/1000
 ·1/2000
```

<Note>
The ON/OFF status for each item is indicated by displaying an asterix (•) or period (·) in front of the item on the screen.

3 Press the SHIFT/ITEM button repeatedly to move the cursor to the position of the mode or shutter speed to be set.

4 The selected mode or speed changes from used (ON) to not used (OFF) and vice versa each time the UP (or DOWN) button is pressed.

5 When menu operations have been completed, set the MENU SET/OFF switch to OFF. The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

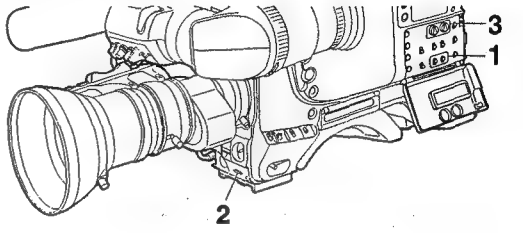
<Note>
When operating the unit from the AQ-EC1 extension control unit (option), even if the SHUTTER SPEED page is operated from the unit, the switches of the AQ-EC1 have priority regarding the actual shutter speed.
•See "Setting Menu Configuration" (page 46) for a description of engineering mode and selecting display pages.

Changing the Iris Automatic Adjustment Reference Value

To change the reference value, change the A. IRIS LEVEL value on the LEVEL 6/6 page of the setting menu using the UP or DOWN button.

Adjusting the Audio Level

If the AUDIO SELECT CH1/CH2 selector switch is set to AUTO, the input levels of audio CH1 and CH2 are automatically adjusted. If are the level of audio channels 1 and 2 to be manually adjusted, perform the following operations.



Manually Adjusting the Audio Level

1 Set the AUDIO SELECT CH1/CH2 selector switch to MAN.

2 Turn the AUDIO LEVEL CH1 control at the bottom of the front panel completely to the right.

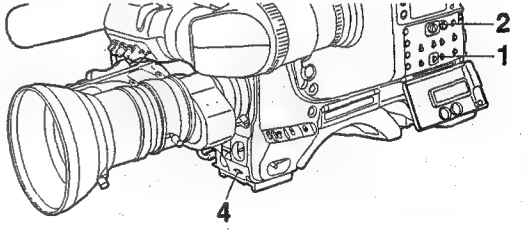
3 Turn the AUDIO LEVEL CH1/CH2 controls to adjust the audio level so that the level meter appears up to 0 dB at the maximum volume.

Limiter

When the audio level is adjusted manually, the limiter circuit operates with respect to excessive input. Limiter circuit operation can be set to ON and OFF at the setting menu. (The factory setting is off.)

Adjusting the Audio CH1 Level from the Viewfinder

The audio CH1 level can be adjusted by the AUDIO LEVEL CH1 control at the bottom of the front panel while watching the viewfinder.



1 Set the AUDIO SELECT CH1 switch to MAN.

2 Turn the AUDIO LEVEL CH1 control on the side panel completely to the right.

3 Set LEVEL METER on the VF DISPLAY page of the setting menu to ON. The audio level display appears on the viewfinder screen.

Adjusting the Audio Level

4 Turn the AUDIO LEVEL CH1 control at the bottom of the front panel to adjust the input volume so that the audio level display appears as shown below.

- When the input volume is normal, the audio level display turns ON up to the seventh of the eight level display bars from the left.
- When the rightmost (0 dB) turns asterisk (*) mark, the input volume is excessive. Adjust the level so that the eighth (0 dB) does not turn * mark.

When the optimal level cannot be set

The maximum attenuation of the AUDIO LEVEL CH1 control at the bottom of the front panel is about 20 dB. When the optimal level cannot be set within this range, adjust the level using the AUDIO LEVEL CH1 control on the side panel.

Using the AUDIO LEVEL CH1 controls at the bottom of the front panel and on the side panel

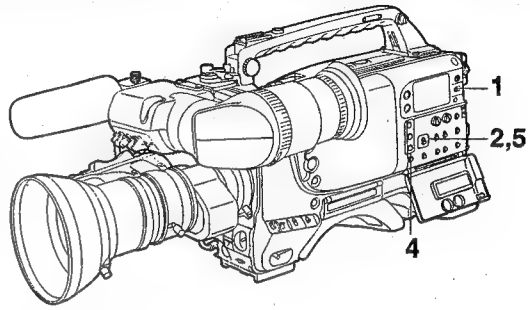
Normally, the control at the bottom of the front panel is turned completely to the right and the recording level is adjusted using the control on the side panel.

The control at the bottom of the front panel is used to throttle the level when the input level increases suddenly during recording.

Setting the Time Data

Setting the Time Code

When using both the user bit and the time code, set the user bit first. If the time code is set first, the time code generator will stop while the user bit is being set, causing the set time code to become inaccurate. The time code can be set within the range of 00:00:00:00 to 23:59:59:29.



1 Set the DISPLAY switch to TC.

2 Set the TCG switch to SET.

3 Set TC MODE on the FUNCTION 3/5 page of the setting menu to DF or NDF. Select DF when the time code is to be advanced during drop frame mode, and NDF when the time code is to be advanced during non-drop frame mode.

4 Set the time code using the SHIFT/ITEM, UP and DOWN buttons.

SHIFT/ITEM button: This is used to cause the digit which is to be set to flash. Each time it is pressed, the flashing digit moves to the right.
UP button: This increments by 1 the figure of the flashing digit.
DOWN button: This decrements by 1 the figure of the flashing digit.

5 Set the TCG switch.

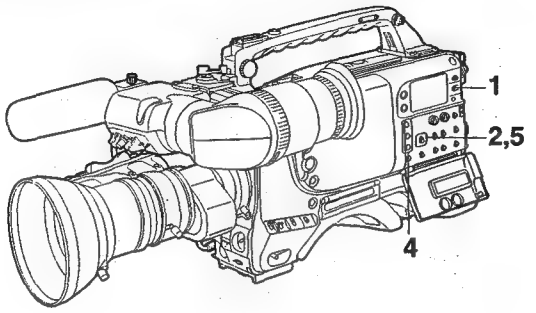
Set the switch to F-RUN when the time code is to be advanced regardless of the VTR's operation.
Set the switch to R-RUN when the time code is to be advanced only while recording is in progress.

Time code status during battery replacement

The back-up mechanism functions even while replacing the battery to allow the time code generator to continue operating for extended periods of time (approx. 1 year).

Setting the User Bit

Setting the user bit allows up to 8 digits of hexadecimal data such as memos (date, time), etc. to be recorded in the sub code track.



1 Set the DISPLAY switch to UB.

2 Set the TCG switch to SET.

3 Set UB MODE on the FUNCTION 3/5 page of the setting menu to REAL.

4 Set the user bit using the SHIFT/ITEM, UP and DOWN buttons.
SHIFT/ITEM button: This is used to cause the digit which is to be set to flash. Each time it is pressed, the flashing digit moves to the right.
UP/DOWN buttons: These increment/decrement by 1 the figure of the flashing digit.

The hexadecimal characters A to F appear as follows.

Hexadecimal	A	B	C	D	E	F
Display	*A*	*b*	*C*	*d*	*E*	*F*

5 Set the F-RUN/R-RUN switch to F-RUN or R-RUN.

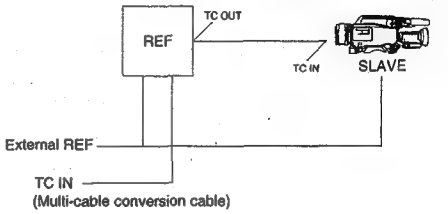
User bit memory function
The user bit setting (except for the real time) is automatically stored in the memory and held even after the power is turned off. However, care should be taken as the settings are not stored in the memory if the time from when the power was turned on until the setting operations are completed and the power is turned off is less than 20 seconds.

Locking the Time Code to an External Source

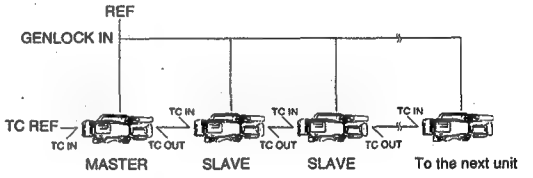
The time code generator of the VTR section can be locked to an external generator.

Example of connections for external locking

Example 1: Locking the time code to an external signal

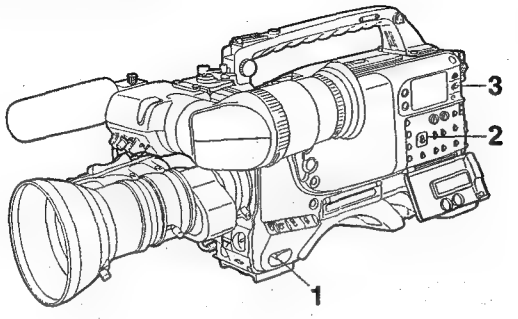


Example 2: Connecting multiple units and using one unit as the reference



Setting the Time Data

External Lock Operation Procedure



1 Set the POWER switch to ON.

2 Set the F-RUN/R-RUN switch to F-RUN.

3 Set the DISPLAY switch to TC.

4 Supply reference time code and reference video signals with a phase relationship which meets the time code standards to the TC IN and GENLOCK IN connectors, respectively.

This locks the built-in time code generator to the reference time code. After about 10 seconds have passed since the time code generator was locked, the external lock status is maintained even if the external reference time code is disconnected. However, if the reference time code is disconnected during recording (REC), the servo lock will be thrown out of order.

<Note>
When the external locking operation is performed, the time code is locked instantly to the external time code and the same value as the external code value appears in the counter display position. Do not set the VTR to recording mode for several seconds until the sync generator has stabilized.

Setting Time Data

User bit setting during external locking
When the time code is locked to an external source, only the time data is locked to the time data of the time code from the external source. Accordingly, the user bit can be set independently for each unit. The user bit can also be locked to the user bit of the time code from the external source.
- Consult your dealer for a detailed explanation.

Releasing the external lock
Stop supplying the external time code and then set the F-RUN/R-RUN switch to R-RUN.

Switching the power supply from the battery to an external power supply during external locking
In order to maintain power supply continuity for the time code generator, connect the external power supply to the DC IN connector before unplugging the battery pack. If the battery pack is unplugged first, the external locking continuity of the time code cannot be assured.

Synchronizing the camera section to an outside source during external locking
While the time code is locked to an external source, the camera section is genlocked by the reference video signal input to the GENLOCK IN connector.

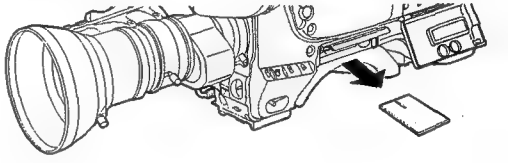
Setup Card Operations

Setting menu contents can be stored using setup cards (option). This data can then be used to quickly recreate the appropriate setup conditions. Subject data, etc. can also be stored on setup cards. See the Setup Card Application Instructions for a detailed description.
- Setup cards are optional, and general purpose memory cards (S RAM 64 Kbyte or more) can be used.

Setup Card Handling

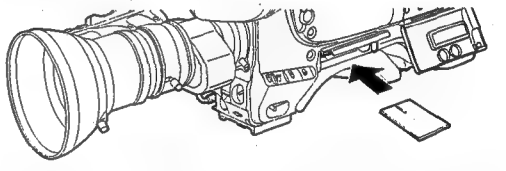
Setup cards can be inserted and ejected regardless of whether the power is on or off.
However, setup cards should not be inserted or ejected during recording as this may result in misoperation.

Ejecting setup cards
Lift up on the lower edge of the cover to open the cover and remove the setup card.



<Note>
Take care not to touch the connectors at the front of the setup card.

Inserting setup cards
Position the unit so that the panel with the logo faces you, insert the setup card into the setup card insertion slot and then close the cover.



<Note>
Check that the unit is positioned with the logo facing you and that the characters are facing the correct direction, and then insert the card. Be sure to insert the card in the correct direction. If the card is difficult to insert, the card may be backwards or upside-down. In these cases, do not attempt to force in the card, but check whether the card is backwards or upside-down and then reinsert the card.

Usage and storage precautions
The following points should be observed when using and storing setup cards.
- Avoid high temperatures and humidity.
- Do not expose setup cards to water.
- Avoid electrostatic charges.

Store setup cards inserted in the unit with the cover closed.

Setup Card Data Operations

Operations to store setting data on setup cards and read out stored data are performed at the SET UP CARD page of the setting menu.

<Note>

When operating the unit with a remote controller, the SET UP CARD page cannot be operated from the unit.

Formatting setup cards

1 Set the MENU SET/OFF switch to SET. The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first page appears.)

2 Press the MENU switch repeatedly until the SET UP CARD page shown below appears. (This operation can also be performed using the PAGE+UP/DOWN function.)

```
- SET UP CARD -

·READ ( ·CAM)
 WRITE ( ·CARD)
 CARD CONFIG.
 ID READ/WRITE :ON
 FUNCTION1-2R/W:ON
 L/M/H SET R/W :ON.
 LEVEL 1-6 R/W :ON
```

3 Press the SHIFT/ITEM button repeatedly to move the cursor to the CARD CONFIG. position.

4 Press the UP (or DOWN) button. When the setup card has been formatted, the message shown below appears.

<Note>

When setup cards are formatted, the setting conditions at that time are also input simultaneously.

```
- SET UP CARD -

 READ ( ·CAM)
 WRITE ( ·CARD)
·CARD CONFIG.
 ID READ/WRITE :ON
 FUNCTION1-2R/W:ON
 L/M/H SET R/W :ON
 LEVEL 1-6 R/W :ON

      FORMAT OK
```

5 When menu operations have been completed, return the MENU SET/OFF switch to OFF. The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

When data is not written

If the following error messages appear when the UP (or DOWN) button is pressed in step 4, the data is not written.

Data format error messages

Error message	Condition	Countermeasure
WRITE PROTECT	The write protect switch on the side of the card is set to ON.	Set the write protect switch on the side of the card to OFF.
NO CARD	A setup card is not inserted.	Insert a card.
ERROR	The disk cannot be formatted.	The card may be defective. Replace the card.

Writing set data to cards

1 Set the MENU SET/OFF switch to SET. The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first page appears.)

2 Press the MENU switch repeatedly until the SET UP CARD page shown below appears. (This operation can also be performed using the PAGE+UP/DOWN function.)

```
- SET UP CARD -

·READ ( ·CAM)
 WRITE ( ·CARD)
 CARD CONFIG.
 ID READ/WRITE :ON
 FUNCTION1-2R/W:ON
 L/M/H SET R/W :ON
 LEVEL 1-6 R/W :ON
```

3 Press the SHIFT/ITEM button repeatedly to move the cursor to the WRITE (→CARD) position.

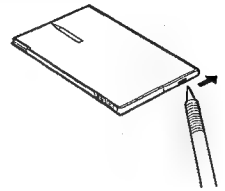
4 Press the UP (or DOWN) button. When writing is complete, the message shown below appears.

```
- SET UP CARD -

 READ ( ·CAM)
·WRITE ( ·CARD)
 CARD CONFIG.
 ID READ/WRITE :ON
 FUNCTION1-2R/W:ON
 L/M/H SET R/W :ON
 LEVEL 1-6 R/W :ON

      WRITE OK
```

5 When menu operations have been completed, return the MENU SET/OFF switch to OFF. The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status appear at the top and bottom of the viewfinder screen.

Protecting stored data

If the setup card's WRITE PROTECT switch is set to ON, data is not rewritten even if the UP (or DOWN) button is pressed in step 4.



When data is not written

If the following error messages appear when the UP (or DOWN) button is pressed in step 4, the data is not written.

Data writing error messages

Error message	Condition	Countermeasure
NO CONFIG	The setup card is not formatted.	Format the card.
NO CARD	A setup card is not inserted.	Insert a card.
WRITE PROTECT	The write protect switch on the side of the card is set to ON.	Set the write protect switch on the side of the card to OFF.
ERROR	Data cannot be written on the card.	The card may be defective. Replace the card.

Setup Card Operations

Reading out data stored on cards

1 Set the MENU SET/OFF switch to SET. The page on which the previous setting menu operations were completed appears on the viewfinder screen. (When the menu is used for the first time, the first page appears.)

2 Press the PAGE switch repeatedly until the SET UP CARD page shown below appears. (This operation can also be performed using the PAGE+UP/DOWN function.)

```
- SET UP CARD -

·READ ( ·CAM)
WRITE ( ·CARD)
CARD CONFIG.
ID READ/WRITE :ON
FUNCTION1-2R/W:ON
L/M/H SET R/W :ON
LEVEL 1-6 R/W :ON
```

3 Press the SHIFT/ITEM button to move the cursor to the READ (→CAM) position.

4 Press the UP (or DOWN) button. When readout is complete, the message shown below appears.

```
- SET UP CARD -

·READ ( ·CAM)
WRITE ( ·CARD)
CARD CONFIG.
ID READ/WRITE :ON
FUNCTION1-2R/W:ON
L/M/H SET R/W :ON
LEVEL 1-6 R/W :ON

READ OK
```

5 When menu operations have been completed, set the MENU SET/OFF switch to OFF. The setting menu disappears from the viewfinder screen and the displays indicating the unit's current status based on the data read out from the setup card appear at the top and bottom of the viewfinder screen.

When data is not read out

If the following error messages appear when the UP (or DOWN) button is pressed in step 4, the data is not read out.

Data readout error messages

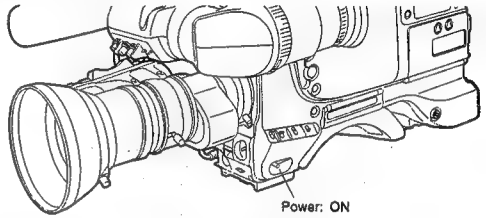
Error message	Condition	Countermeasure
NO CONFIG	The setup card is not formatted.	Format the card.
NO CARD	A setup card is not inserted.	Insert a card.
ERROR	Data cannot be read out.	Data written by devices other than this unit cannot be read out.

Cassettes

Inserting and Ejecting Cassettes

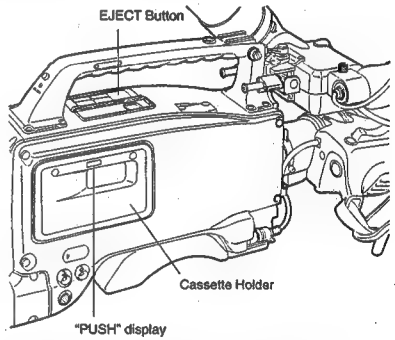
Inserting cassettes

1 Check that there are no cables, etc. around the cassette holder and the top panel and then set the POWER switch to ON.



If condensation has occurred inside the unit, the HUMID display lights. In these cases, wait until the display goes off before proceeding to step 2.

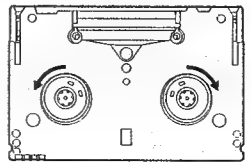
2 Press the EJECT button. The cassette holder opens.



3 Check firmly there is no slack in the tape, insert the cassette, then press the "PUSH" display on the cassette holder to close the cassette holder firmly.

Checking that there is no slack in the tape

Press the reel in with your finger and turn it lightly in the direction of the arrow. If the reel does not turn, there is no slack in the tape.



Cassettes

Ejecting cassettes

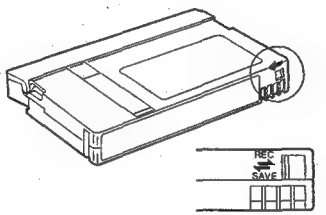
With the power turned on, press the EJECT button to open the cassette holder and eject the cassette. If a cassette is not to be inserted immediately after ejecting the cassette, close the cassette holder.

Ejecting cassettes when the battery has run out

Set the POWER switch to OFF to turn off the power, then turn on the power again and immediately hold down the EJECT button. If there is still power remaining in the battery, the cassette will be ejected. However, this operation should not be repeated.

Preventing Accidental Erasure

Set the tab on the cassette to the SAVE side to prevent the recorded contents of tapes from being accidentally erased.



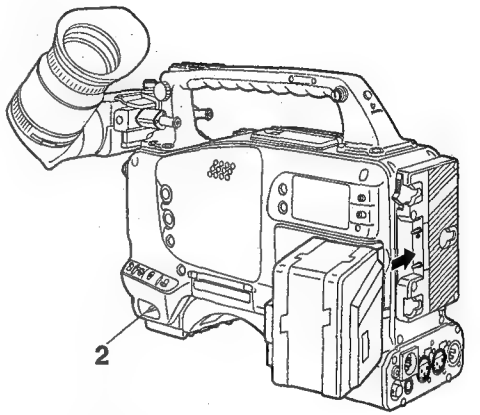
Recording

Basic Procedures

This section describes the basic operating procedures for shooting and recording. When starting to shoot actual images, inspect the unit beforehand to check that all systems are functioning normally.

●See the "Inspections Before Shooting" (page 129) for a description of inspection procedures.

Procedures from power supply preparations to inserting a cassette



1 Insert a charged battery pack.

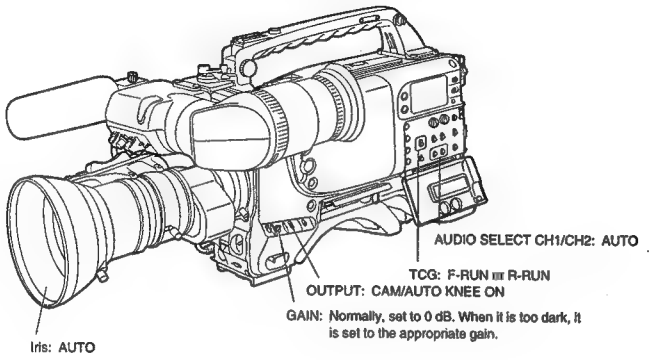
2 Set the POWER switch to ON and check that the HUMID display does not appear and that five or more bars of the remaining battery level display are lighted.
- ●If the HUMID display appears, wait until the display goes off.
- ●If five or more bars of the remaining battery level display are not lighted, replace the battery pack with a sufficiently charged battery pack.

3 Check that there are no cables, etc. around the cassette holder and top panel and then press the EJECT button to open the cassette holder.

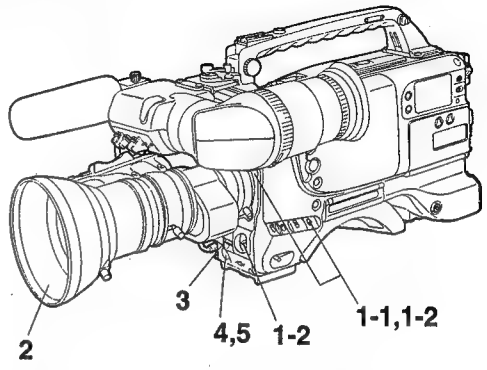
4 Check the following items, and then insert a cassette and close the cassette holder.
- ●The cassette is not set to write protect status.
- ●There is no slack in the tape.

Procedures from adjusting the white balance and black balance to stopping recording

Turn on the power, insert a cassette, and then set the various switches as follows.



Shooting images



1-1 Select the filter in accordance with the lighting conditions, and when the white balance has already been stored in the memory, set the WHITE BAL switch to "A" or "B".
When the white balance and black balance have not been stored in the memory and there is no time to adjust the white balance:
Set the WHITE BAL switch to PRST and set the FILTER knob to "1": this will achieve a 3200 K white balance. (If the knob is set to any other position, a 5600 K white balance is achieved.)

1-2 To adjust the white balance on site, select the filter which corresponds with the lighting conditions, set the WHITE BAL switch to "A" or "B", and adjust the white balance by following the steps below.
(1) Press the AUTO W/B BAL switch to the AWB side to adjust the white balance.
(2) Press the AUTO W/B BAL switch to the ABB side to adjust the black balance.
(3) Press the AUTO W/B BAL switch to the AWB side to adjust the white balance.
For details on how to adjust the white balance, read through the section entitled "Adjusting the white balance/black balance" (page 65).

2 Aim the camera at the subject and adjust the focus and zoom.

3 When using the electronic shutter, set the shutter speed and operation mode.
●See "Setting the Electronic Shutter" (page 70) for a detailed description.

4 Press the VTR START button of the unit or the VTR button of the lens to start recording. The REC lamp inside the viewfinder lights during recording.

5 Press the VTR START button again to stop recording. The REC lamp inside the viewfinder goes off.

Tape operation buttons
The tape operation buttons (EJECT, REW, FF, PLAY, STOP) do not function during recording.

Successive Shooting

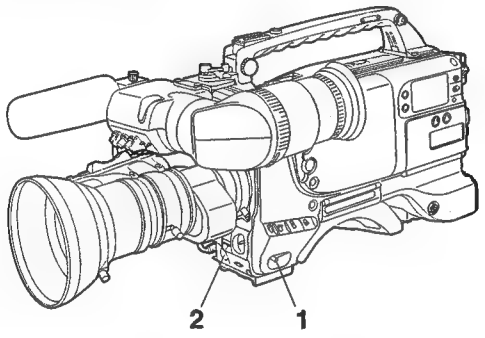
Successive shooting with an accuracy of within 0–+1 frame can be performed simply by pressing the VTR START button of the unit or the VTR button of the lens while recording is paused.

While recording is paused

The unit automatically searches for the successive shooting point. However, the time until recording starts differs according to the setting of the VTR SAVE/STBY switch.

- If the VTR SAVE/STBY switch is set to SAVE, recording starts about 2 seconds after the VTR START button is pressed.
- If the VTR SAVE/STBY switch is set to STBY, recording starts immediately after the VTR START button is pressed.

Successive shooting when the power is turned off while recording is paused

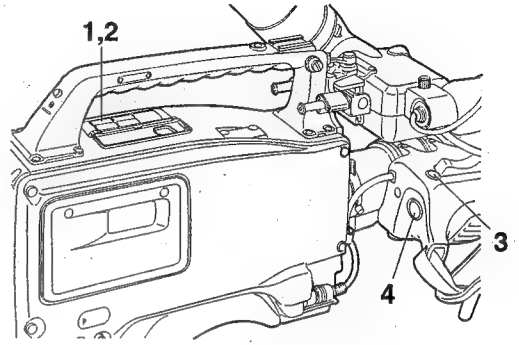


1 Turn the power back on.

2 Press the VTR START button of the unit or the VTR button of the lens to start recording.

Successive Shooting in Other Cases

If successive shooting is to be performed after the tape has been run, the cassette has been ejected, or when using a tape which has only been recorded part-way, follow the procedures outlined below.



1 Press the PLAY button while watching the viewfinder screen and play back the tape.

2 At the place where continuity between frames is to be provided, press the PLAY (or STOP) button again to stop the tape.

3 Press the RET button on the lens. Preparations for frame-to-frame continuity are made about two seconds later.

4 Press the VTR START button of the unit or the VTR button of the lens to start recording.

Playback—Checking Recorded Contents

Pressing the PLAY button allows black-and-white playback images to be viewed on the viewfinder. Playback images can also be viewed in two other ways.

- **Rec review:** If the RET VIDEO switch is set to the INT side, black-and-white images of the last 2 seconds of the recorded contents can be seen on the viewfinder.
- **Color playback:** Connecting a color monitor to the unit's VIDEO OUT connector allows color playback images to be viewed on the monitor.

The playback signal is output to the viewfinder even during rewind (REW) and fast forward (FF). Audio output selection and volume adjustment for the playback signal are performed by the MONITOR switches and knobs on page 13.

Rec Review

If recording is paused and the RET button on the lens is pressed, the tape is automatically rewound and the playback images for the last two seconds appear on the viewfinder. This allows the recording status to be checked.
After playback, the unit returns to the recording start standby status. Holding down the RET button rewinds and plays back up to 10 seconds of the tape.

<Note>
The rec review function cannot be used unless recording has been performed for more than 1 second.

Color Playback

Connecting a color monitor to the VIDEO OUT connector of the unit allows color playback images to be viewed on the monitor.

Connection With an External VTR

The unit is equipped with an interface which enables recording to be performed by an external VTR.

- Mounting the AJ-YA700P 26-pin output adapter (option) and connecting the 26-pin cable (option) to the unit allows recording to be performed by the VTR section (internal VTR) of the unit and an external VTR. The component video signal is output from the 26-pin interface.

Precautions When Connecting an External VTR

Set 26P CONTROL on the FUNCTION 3/5 page of the setting menu to BOTH or ON. (The setting is OFF when shipped from the factory.)

Power supply
Power is not supplied or received between the unit and the external VTR, so special power supplies should be provided for each unit. The BATT lamp and remaining battery level display function inside the viewfinder indicate the power supply status only for the internal VTR. The power supply status for the external VTR should be checked at the external VTR.

TALLY lamp and REC lamp operation
The unit's TALLY lamp and the REC lamp inside the viewfinder indicate the REC status of the unit when 26P CONTROL is set to BOTH. When 26P CONTROL is set to ON, these lamps indicate the REC status of the external VTR.

Warning tone
External VTR-related warning tones are not output from the unit's speaker or PHONES jack.

Note on connecting cables
The signals may not be connected properly with some cables.
The signal assignments for the 26-pin output adapter AJ-YA700P (optional) are shown in the following table. Use this table as a reference for connection with an external VTR.

Pin No.	Signal	Pin No.	Signal
1	Composite video signal	8	P_B GND
2	Composite video GND	9	CAM MIC (H)
3	Y GND	10	CAM MIC (C)
4	Y signal	11	CAM MIC (GND)
5	P_A signal	12	VTR START/STOP
6	P_A GND	15	REC TALLY
7	P_B signal	8	GND

Recording Simultaneously with the Internal VTR and an External VTR

Connections

Mount the AJ-YA700P 26-pin output adapter (option) to the unit, connect the external VTR with the 26-pin cable, and set the audio input level selector switch of the external VTR to "−60 dB". SW3101 and SW3102 on the CAM ENC Printed Circuit Board of the unit must be set to the 26P side. (See page 97.)

To the 26-pin connector of the AJ-YA700P (See page 97 for mounting the 26-pin output adapter)

Checking the Function Settings

Check that the settings of the functions which control the 26-pin interface are set to BOTH or ON at the FUNCTION 3/5 page of the setting menu. See "Selecting Functions" for a description of the various function settings.

Starting Recording

1 Operate the external VTR and set it to recording paused status.

2 Press the VTR START button of the unit or the VTR button of the lens. The internal and external VTRs start recording simultaneously. Pressing the button again sets both VTRs to the recording paused status.

If One VTR Comes to the End of its Tape During Recording

Even if one VTR comes to the end of its tape and stops, the other VTR continues recording operation.

Returning the VTRs to simultaneous recording status

- If the internal VTR came to the end of its tape, replace the cassette and press the VTR START button of the unit or the VTR button of the lens. The external VTR continues recording operation during this time.
- If the external VTR came to the end of its tape, replace the cassette and operate the external VTR to restart recording. The internal VTR continues recording operation during this time.

<Note>
Care should be taken as the internal VTR will assume recording paused status if the VTR START button of the unit or the VTR button of the lens is pressed after replacing the external VTR's cassette.

Recording Simultaneously with the Internal VTR and an External VTR

Functions of the Unit's VTR SAVE/STBY Switch

Tape running mode
Pressing the unit's STOP, REW or FF buttons sets the internal VTR to stop, rewind or fast forward modes, respectively. However, the external VTR is set to recording paused status in all cases.

Viewing playback images on the viewfinder
Pressing the unit's PLAY button allows black-and-white playback images from the internal VTR tape to be viewed on the viewfinder. Playback images from the external VTR cannot be viewed.

Using the 26-pin Output Adapter

Connections

The method of connecting the external VTR is the same as that described in "Recording Simultaneously with the Internal VTR and an External VTR".

•See "Connections" on page 94.

Mounting the 26-pin output adapter

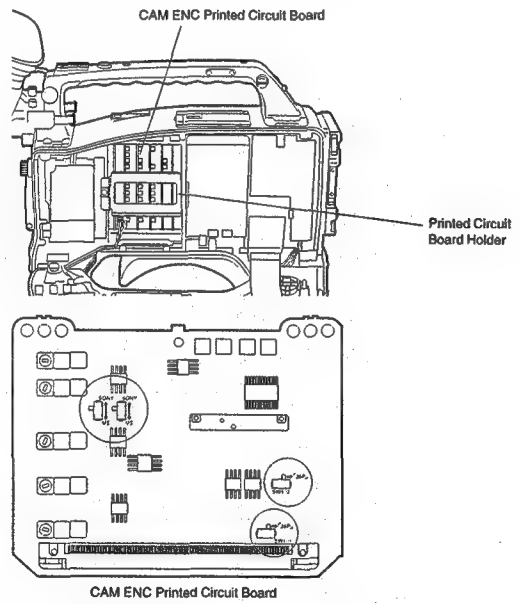
•Consult your local dealer when mounting the adapter.

1 Set the unit's internal switches.

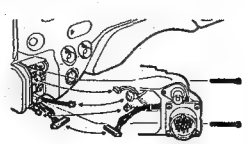
1 Remove the side panel on the display window side.

2 Remove the Printed Circuit Board holder and remove the CAMERA ENC Printed Circuit Board.

3 Set SW101 and SW102 to the 26P side.



2 Mount the 26-pin output adapter.



Controlling the external VTR with the unit's switches

Setting the 26P CONTROL function as indicated below at the FUNCTION 3/5 page of the setting menu prevents the internal VTR from being operated and enables only the external VTR to be controlled by the VTR START button of the unit or the VTR button of the lens.

•26P CONTROL: ON

•See "Selecting Functions" (page 64) for a description of FUNCTION 3/5 page operations.

Switching from the internal VTR to the external VTR

If the internal VTR experiences problems (tapes becoming tangled, condensation, etc.) during operation and becomes unable to operate, the VTR START button of the unit and the VTR button of the lens will not function. In these cases, setting the 26P CONTROL function as noted above at the FUNCTION 3/5 page allows the external VTR to be operated in place of the internal VTR using the VTR START button of the unit or the VTR button of the lens.

Starting recording

Operate the external VTR to set it to recording paused status and press the VTR START button of the unit or the VTR button of the lens. The external VTR starts recording. Pressing the button again sets the VTR to the recording paused status.

Output level of the 26-pin output adapter

When the unit is shipped from the factory, the audio level is set to −60 dBu balanced and the component video level is set to Sony level (see page 97). The audio level can be set to −20 dBu unbalanced and the component video level to MII level with an internal switch. Consult your dealer for a detailed description.

RET Button

The images recorded on the VTR or return video signal which has been input to the Time code VIDEO IN connector can be seen on the viewfinder screen when the RET (return video) button is pressed or while it is kept pressed in.
What is displayed on the viewfinder screen changes as indicated in the table below according to the RET VIDEO switch setting and VTR mode.

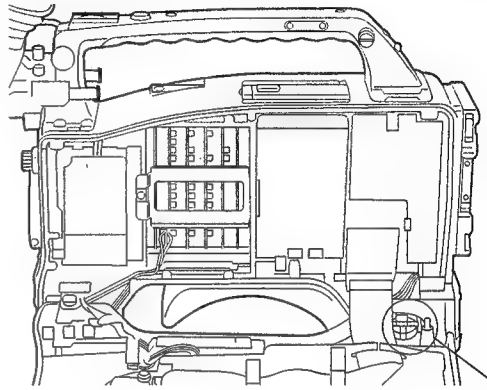
<Note>
When the REC SIGNAL item is set to VIDEO (when recording external input) at the MAIN FUNCTION page of the setting menu, the external input appears on the viewfinder screen. However, the camera image appears on the viewfinder screen while the RET button is held down.

■ **Lens RET button functions**

RET VIDEO switch setting	Internal VTR mode	Description of what appears on viewfinder screen
INT	Recording	Images shot by camera. RET button does not function.
	Recording paused	What has been recorded (2-second rec review) can be checked.
	Playing	Internal VTR's playback images. RET button does not function.
	Playback paused	Search operation for successive shooting.
EXT	Recording	Return video signal which has been supplied to VIDEO IN connector.
	Recording paused	Return video signal which has been supplied to VIDEO IN connector.
	Playing	Return video signal which has been supplied to VIDEO IN connector.
	Playback paused	Return video signal which has been supplied to VIDEO IN connector.

Replacing the Backup Battery

The unit is shipped from the factory with a backup battery already mounted. When the battery runs out, the TCG time code value indicates 00:00:00:00.
At this time, the time code value cannot be backed up.
In addition, the "BACK UP BATT EMPTY" display appears in the viewfinder for ▯ seconds when the POWER switch is set to ON to indicate that the battery must be replaced.
Consult your dealer when replacing the battery.



MARKER Screen

This page sets the setting for the marker displays inside the viewfinder.

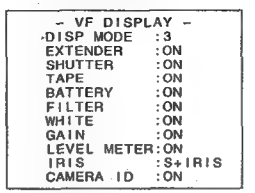
Item	Variable range	VF display	Remarks
CENTER MARK	<u>ON</u> OFF	USER ENG	Center mark display ON/OFF
SAFETY ZONE	OFF <u>1</u>–6	USER ENG	Safety zone switching/display OFF

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

VF DISPLAY Screen

This page sets the setting for the display information inside the viewfinder.



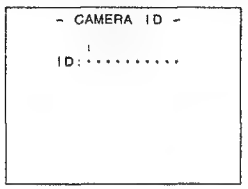
Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

Item	Variable range	VF display	Remarks
DISP MODE	1–<u>3</u>	USER ENG	Change / Display (1 / 2 / 3): FILTER × × ○ GAIN × × ○ AWB × × ○ AUTO KNEE SW × ○ ○ SHUTTER × ○ ○ ABB ATATUS × ○ ○ AWB STATUS × ○ ○
EXTENDER	<u>ON</u> OFF	USER ENG	Extender display ON/OFF
SHUTTER	<u>ON</u> OFF	USER ENG	Shutter speed display ON/OFF
TAPE	<u>ON</u> OFF	USER ENG	Remaining tape length display ON/OFF
BATTERY	<u>ON</u> OFF	USER ENG	Battery voltage display ON/OFF
FILTER	<u>ON</u> OFF	USER ENG	Filter No. display ON/OFF
WHITE	<u>ON</u> OFF	USER ENG	AWB PRE/A/B display ON/OFF
GAIN	<u>ON</u> OFF	USER ENG	Currently selected gain display ON/OFF
LEVEL METER	<u>ON</u> OFF	USER ENG	Audio level meter display ON/OFF
IRIS	IRIS <u>S+IRIS</u> S OFF	USER ENG	IRIS: Only the f-number is displayed. S+IRIS: Both the super iris ON status and f-number are displayed. S: Only the super iris ON status is displayed. OFF: Neither the super iris ON status nor f-number is displayed.
CAMERA ID	<u>ON</u> OFF	USER ENG	ID Mix ON/OFF during color bar recording

The underlined setting in the Variable range column indicates the preset mode.

CAMERA ID Screen

This page performs the camera ID settings. Each time the UP button is pressed, the character display changes in the order of space, English letters (A to Z), numbers (0 to 9) and symbols [space, >, <,), (, ', ', „ --, -, ~, /, !]. Pressing the DOWN button changes the character display in the reverse order.

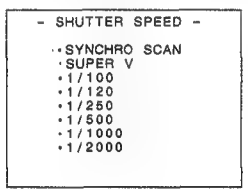


Item	Variable range	VF display	Remarks
ID: ••••••••••	——	USER ENG	Camera ID input

<Note>
Whether or not this set value is to be mixed is selected by setting CAMERA ID on the VF DISPLAY screen to ON or OFF.

SHUTTER SPEED Screen

This page performs the shutter speed settings. The ON/OFF status for each item is indicated by displaying an asterix (•) or period (·) in front of the item on the screen.



•: ON
·: OFF

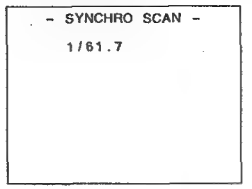
Item	Variable range	VF display	Remarks
SYNCHRO SCAN	ON OFF	ENG	Synchro scan shutter speed setting
SUPER V	ON OFF	ENG	SUPER V mode setting
1/100	ON OFF	ENG	Shutter speed 1/100 setting ON/OFF
1/120	ON OFF	ENG	Shutter speed 1/120 setting ON/OFF
1/250	ON OFF	ENG	Shutter speed 1/250 setting ON/OFF
1/500	ON OFF	ENG	Shutter speed 1/500 setting ON/OFF
1/1000	ON OFF	ENG	Shutter speed 1/1000 setting ON/OFF
1/2000	ON OFF	ENG	Shutter speed 1/2000 setting ON/OFF

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

SYNCHRO SCAN Screen

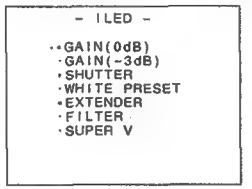
This page performs the synchro scan settings.



Item	Variable range	VF display	Remarks
SYNCHRO SCAN	1/30.4 ⋮ 1/61.7 ⋮ 1/250	USER ENG	Synchro shutter speed selection

! LED Screen

This page sets the ON/OFF setting for the ! LED display inside the viewfinder. The ON/OFF status for each item is indicated by displaying an asterix (•) or period (·) in front of the item on the screen.



•: ON
·: OFF

Item	Variable range	VF display	Remarks
GAIN (0 dB)	ON OFF	ENG	This selects whether or not the LED is lighted when the gain is any value other than 0 dB.
GAIN (–3 dB)	ON OFF	ENG	This selects whether or not the LED is lighted when the gain is any value other than –3 dB.
SHUTTER	ON OFF	ENG	This selects whether or not the LED is lighted when the shutter is ON.
WHITE PRESET	ON OFF	ENG	This selects whether or not the LED is lighted when the AWB CH is PRESET.
EXTENDER	ON OFF	ENG	This selects whether or not the LED is lighted when the lens is in EXTENDER mode.
FILTER	ON OFF	ENG	This selects whether or not the LED is lighted when the filter is any value other than 3200K.
SUPER V	ON OFF	ENG	This selects whether or not the LED is lighted when SUPER V is ON.

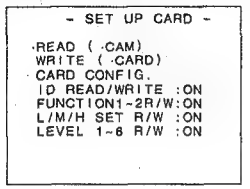
<Note>
The ! LED lights when both GAIN (0 dB) and GAIN (–3 dB) are ON unless the gain is set to –3 dB or 0 dB.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

SET UP CARD Screen

This page set the loading, saving and configuration operations for the setup cards. Align "→" with the desired item and press the UP or DOWN button to perform the corresponding processing.



Item	Variable range	VF display	Remarks
READ (→CAM)	—	USER ENG	Setup card data is read.
WRITE (→CARD)	—	USER ENG	The camera data is written on the setup card.
CARD CONFIG.	—	USER ENG	The setup card is formatted.
ID READ/WRITE	ON OFF	USER ENG	CAMERA ID READ/WRITE is switched ON or OFF when data is read from or written on the set-up card. **ON:** Read/write is enabled. **OFF:** Read/write is disabled.
FUNC 1~2 R/W	ON OFF	USER ENG	READ/WRITE for FUNCTION 1 and FUNCTION 2 is switched ON or OFF when data is read from or written on the setup card. **ON:** Read/write is enabled. **OFF:** Read/write is disabled.
L/M/H SET R/W	ON OFF	USER ENG	READ/WRITE of gain value for LOW SETTING, MID SETTING and HIGH SETTING is switched ON or OFF when data is read from or written on the setup card. **ON:** Read/write is enabled. **OFF:** Read/write is disabled.
LEVEL 1~6 R/W	ON OFF	USER ENG	READ/WRITE for LEVEL 1/6, 2/6, 3/6, 4/6, 5/6 and 6/6 is switched ON or OFF when data is read from or written on the setup card. **ON:** Read/write is enabled. **OFF:** Read/write is disabled.

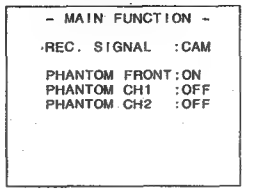
*For example, so as not to change the CAMERA ID when reading from, or writing to the SET UP CARD, the ID READ/WRITE should be selected to OFF.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

MAIN FUNCTION Screen

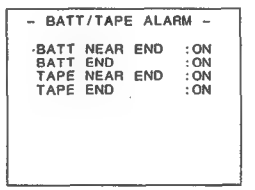
This page performs the adjustment function settings.



Item	Variable range	VF display	Remarks
PHANTOM FRONT	ON OFF	ENG	Phantom microphone (front) usage selection ON: Phantom microphone (+48 V) used. OFF: Normal microphone used.
PHANTOM CH1	ON OFF	ENG	Phantom microphone (CH1) usage selection ON: Phantom microphone (+48 V) used. OFF: Normal microphone used.
PHANTOM CH2	ON OFF	ENG	Phantom microphone (CH2) usage selection ON: Phantom microphone (+48 V) used. OFF: Normal microphone used.

BATT/TAPE ALARM Screen

The battery end and tape end audio warnings during shooting can be switched off if they become undesirable.



Item	Variable range	VF display	Remarks
BATT NEAR END	ON OFF	ENG	Battery near end audio ON/OFF
BATT END	ON OFF	ENG	Battery end audio warning ON/OFF
TAPE NEAR END	ON OFF	ENG	Tape near end audio warning ON/OFF
TAPE END	ON OFF	ENG	Tape end audio warning ON/OFF

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

FUNCTION 1/5 Screen

This page performs the adjustment function 1 settings. The ON/OFF status for each item is indicated by displaying an asterix (•) or period (·) in front of the item on the screen.

```
- FUNCTION 1/5 -

··DETAIL
 •2D LPF
 ·SKIN TONE DTL
 •MATRIX
 •GAMMA
 ·TEST SAW
 •FLARE
```

•: ON
·: OFF

Item	Variable range	VF display	Remarks
DETAIL	ON OFF	ENG	Detail (H, V) ON/OFF switching
2D LPF	ON OFF	ENG	ON/OFF switching for 2-dimensional LPF (Low Pass Filter) which reduces color smear
SKIN TONE DTL	ON OFF	ENG	Skin tone detail ON/OFF switching
MATRIX	ON OFF	ENG	Color adjustment ON/OFF switching
GAMMA	ON OFF	ENG	Gamma circuit ON/OFF switching
TEST SAW	ON OFF	ENG	Test signal ON/OFF switching
FLARE	ON OFF	ENG	Flare compensation ON/OFF switching

FUNCTION 2/5 Screen

This page performs the adjustment function 2 settings.

```
- FUNCTION 2/5 -

·SUPER V          :FRM1
 FILTER INH       :OFF
 SHOCKLESS AWB    :NORMAL
 S.IRIS SW        :S.IRIS
 S.SCAN SEL       :ON
```

Item	Variable range	VF display	Remarks
SUPER V	FRM1 FRM2	ENG	Super V switching FRM1: Normal mode FRM2: Lag reduction mode
FILTER INH	ON OFF	ENG	Switch that determines whether AWB memory (Ach, Bch) data is stored for each filter. ON: Ach and Bch memory only (2 memory units), regardless of the filter. OFF: Data is stored for each filter. (4×2=8 memory units)
SHOCKLESS AWB	OFF NORMAL SLOW FAST	ENG	Shockless AWB ON (NORMAL/SLOW/FAST)/OFF switching*
S.IRIS SW	S.IRIS 30 dB OFF	ENG	Super iris (S.IRIS)/30 dB/OFF switching
S.SCAN SEL	ON OFF	ENG	Synchro scan ON/OFF switching ON: S.SCAN speed can be varied by the SUPER IRIS/MODE CHECK switch. OFF: Normal mode

*SHOCKLESS AWB ensures that no shock will occur when A/B/PRST setting of the WHITE BAL switch is changed. FAST (high speed), NORMAL (normal speed) or SLOW (low speed) can be set as the selection time.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

FUNCTION 3/5 Screen

This page performs the adjustment function 3 settings.

```
- FUNCTION 3/5 -

·HUMID OPE     :OFF
 26P CONTROL   :OFF
 REC START     :NORMAL
 TC MODE       :DF
 UB MODE       :USER
 PAUSE TIMER   :30
 BATTERY SEL   :NiCd12
 TCG VF DISP   :OFF
 TCG SET HOLD  :OFF
 FIRST REC TC  :REGEN
```

Item	Variable range	VF display	Remarks
HUMID OPE	ON OFF	ENG	VTR operation selection when condensation occurs. ON: Operation continues normally. OFF: All operations prohibited except for POWER switch and EJECT button.
26P CONTROL	OFF BOTH ON	ENG	26P remote control selection OFF: Unit only (26P control does not function.) BOTH: Unit and 26P remote control (TALLY LED indicates unit REC status.) ON: 26P remote control only (TALLY LED indicates 26P VTR REC status.)
REC START	ALL NORMAL	ENG	REC acceptance selection for VTR START/STOP ALL: REC accepted regardless of VTR mode. NORMAL: REC accepted only during STOP (POWER SAVE) mode and REC PAUSE mode.
TC MODE	DF NDF	ENG	Time code DF/NDF switching DF: Drop frame mode NDF: Non-drop frame mode
UB MODE	USER REAL EXT	ENG	LTC UB usage method selection USER: User setting (fixed value) REAL: Real-time operation according to the TIME DATE time EXT: When there is external TC input, the UBG value is slave locked. (When there is no external input, the user setting is used.)
PAUSE TIMER	10 20 30	ENG	Selection for the recording/pause hold time. 10: 10 minutes 20: 20 minutes 30: 30 minutes

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

FUNCTION 3/5 Screen

This page performs the adjustment function 3 settings.

```
- FUNCTION 3/5 -
HUMID OPE     :OFF
26P CONTROL   :OFF
REC START     :NORMAL
TC MODE       :DF
UB MODE       :USER
PAUSE TIMER   :30
BATTERY SEL   :NiCd12
TCG VF DISP   :OFF
TCG SET HOLD  :OFF
FIRST REC TC  :REGEN
```

Item	Variable range	VF display	Remarks
BATTERY SEL	NiCd12 NiCd13 NiCd14 IDXL-40 L-60 L-90 ANTON-D IDX-D	ENG	Battery type selection **NiCd12:** When a 12 V NiCd battery is used **NiCd13:** When a 13 V NiCd battery is used **NiCd14:** When a 14 V NiCd battery is used **IDXL-40:** When the L-40 battery made by IDX is used **L-60/L-90:** When a battery made by Sony is used **ANTON-D:** When a battery made by Anton Bauer is used **IDX-D:** When a battery made by IDX is used digitally
TCG VF DISP	ON OFF	ENG	Viewfinder time code display ON/OFF ON: Time code is displayed. OFF: Time code is not displayed.
TCG SET HOLD	ON OFF	ENG	Selection for TCG operation when operation is performed in the following sequence: TCG SET→power OFF→power ON→REC. **ON:** The fact that TCG SET has been selected is stored in the memory when the power is switched off, and regeneration is not performed. **OFF:** The fact that TCG SET has been selected is not stored in the memory when the power is switched off, and regeneration is performed.
FIRST REC TC	REGEN PRESET	ENG	Selection for TC REGEN mode when recording starts. **REGEN:** Regeneration is performed in the time code on the tape. **PRESET:** Regeneration is not performed in the time code on the tape. However, when the mode is transferred from REC/PAUSE to REC, regeneration is forcibly performed.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

FUNCTION 4/5 Screen

This page performs the adjustment function 4 settings.

```
- FUNCTION 4/5 -
FRONT MIC       :-40dB
REAR MIC CH1    :-60dB
REAR MIC CH2    :-60dB
LINE CH1/CH2    :+4dB
REAR AUDIO      :STEREO
MIC LOWCUT CH1  :OFF
MIC LOWCUT CH2  :OFF
EMPHASIS        :OFF
CUE AUDIO       :CH1
```

Item	Variable range	VF display	Remarks
FRONT MIC	–40/ –50/ –60 dB	ENG	Camera microphone input level selection
REAR MIC CH1	–40/ –50/ –60 dB	ENG	Rear jack AUDIO CH1 input microphone level selection
REAR MIC CH2	–40/ –50/ –60 dB	ENG	Rear jack AUDIO CH2 input microphone level selection
LINE CH1/CH2	+4/0/ –6 dB	ENG	Rear jack AUDIO CH1/CH2 input line input level selection
REAR AUDIO	STEREO MONO	ENG	Audio CH1/CH2 rear jack input selection STEREO: Selects stereo input (CH1 input is recorded in CH1 and CH2 input is recorded in CH2.) MONO: Selects monaural input (The signals of CH1 and CH2 are mixed and recorded in CH1 and CH2 respectively.)
MIC LOWCUT CH1	ON OFF	ENG	CH1 microphone bypass filter ON/OFF switching
MIC LOWCUT CH2	ON OFF	ENG	CH2 microphone bypass filter ON/OFF switching
EMPHASIS	ON OFF	ENG	Emphasis ON/OFF switching
CUE AUDIO	CH1 CH2 MIX	ENG	CUE AUDIO recording setting CH1: Records CH1 AUDIO CH2: Records CH2 AUDIO MIX: Records CH1 and CH2 mixed AUDIO.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

FUNCTION 5/5 Screen

This page performs the adjustment function 5 settings.

```
- FUNCTION 5/5 -

·AUDIO OUT     :CH1
 LIMITER       :ON
 TEST TONE     :ON
```

Item	Variable range	VF display	Remarks
AUDIO OUT	CH1/ CH2/ MIX	ENG	AUDIO OUT selection CH1: CH1 output to AUDIO OUT CH2: CH2 output to AUDIO OUT MIX: CH1 and CH2 mixed and output to AUDIO OUT
LIMITER	ON OFF	ENG	Audio limiter ON/OFF switching ON: Limiter ON OFF: Limiter OFF
TEST TONE	ON OFF	ENG	Audio test tone ON/OFF switching during color bar output

TIME DATE Screen

This page performs the date and time settings. After the date and time have been changed, pressing the UP or DOWN buttons executes the settings.

```
- TIME/DATE -

·YEAR   :99
 MONTH  :01
 DAY    :01
 HOUR   :00
 MINUTE :00

■TIME/DATE SET
```

Item	Variable range	VF display	Remarks
YEAR	00 to 99	ENG	Year setting
MONTH	1 to 12	ENG	Month setting
DAY	1 to 31	ENG	Day setting
HOUR	0 to 23	ENG	Hour setting
MINUTE	0 to 59	ENG	Minute setting
TIME/DATE SET	——	ENG	Date/time confirmation

<Note>
The seconds cannot be set. The time always starts from the zero second setting.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

LOW SETTING Screen

This page sets the low level.

```
- LOW SETTING -

·MASTER GAIN   : 0dB
 H.DTL LEVEL   :13
 V.DTL LEVEL   :10
 DTL CORING    :08
 H.DTL FREQ.   :03
 DARK DTL      :00
 LEVEL DEPEND  :03
 MASTER GAMMA  :0.60
 BLACK STRETCH:OFF
 MATRIX TABLE  :A
```

Item	Variable range	VF display	Remarks
MASTER GAIN	−3 dB ⋮ 0 dB ⋮ 30 dB	ENG	Gains of −3, 0, 3, 6, 9, 12, 15, 18, 21, 24 and 30 dB (S. H. GAIN) can be set.
H.DTL LEVEL	0 ⋮ 13 ⋮ 31	ENG	H.DTL (detail) level setting
V.DTL LEVEL	0 ⋮ 10 ⋮ 31	ENG	V.DTL (detail) level setting
DTL CORING	0 ⋮ 8 ⋮ 15	ENG	DTL coring setting
H.DTL FREQ.	1 ⋮ 3 ⋮ 5	ENG	H.DTL frequency selection 1: 2.5 MHz 4: 4 MHz 2: 3 MHz 5: 4.5 MHz 3: 3.5 MHz
DARK DTL	0 ⋮ 5	ENG	Dark detail setting It boosts the detail of the black areas.
LEVEL DEPEND.	0 ⋮ 3 ⋮ 5	ENG	LEVEL DEPEND. setting It eliminates the detail only in the dark areas when the Y detail is boosted. The higher the number selected, the wider the range across which the detail is eliminated.
MASTER GAMMA	0.35 ⋮ 0.60 ⋮ 0.75	ENG	Master gamma setting 0.01 steps
BLACK STRETCH	ON OFF	ENG	ON/OFF switching for mode which compensates low-illumination black-out
MATRIX TABLE	A B	ENG	Color compensation table selection

<Note>
DARK DTL and LEVEL DEPEND function in a mutually opposite way: LEVEL DEPEND is automatically set to 0 when DARK DTL is set to a value other than 0; and DARK DTL is automatically set to 0 when LEVEL DEPEND is set to a value other than 0.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

MID SETTING Screen

This page sets the middle level.

```
- MID SETTING -

MASTER GAIN   : 9dB
H.DTL LEVEL   :13
V.DTL LEVEL   :10
DTL CORING    :08
H.DTL FREQ.   :03
DARK DTL      :00
LEVEL DEPEND  :03
MASTER GAMMA  :0.60
BLACK STRETCH:OFF
MATRIX TABLE  :A
```

Item	Variable range	VF display	Remarks
MASTER GAIN	−3 dB ⋮ 9 dB ⋮ 30 dB	ENG	Gains of −3, 0, 3, 6, 9, 12, 15, 18, 21, 24 and 30 dB (S. H. GAIN) can be set.
H.DTL LEVEL	0 ⋮ 13 ⋮ 31	ENG	H.DTL (detail) level setting
V.DTL LEVEL	0 ⋮ 10 ⋮ 31	ENG	V.DTL (detail) level setting
DTL CORING	0 ⋮ 8 ⋮ 15	ENG	DTL coring setting
H.DTL FREQ.	1 ⋮ 3 ⋮ 5	ENG	H.DTL frequency selection 1: 2.5 MHz 4: 4 MHz 2: 3 MHz 5: 4.5 MHz 3: 3.5 MHz
DARK DTL	0 ⋮ 5	ENG	Dark detail setting It boosts the detail of the black areas.
LEVEL DEPEND.	0 ⋮ 3 ⋮ 5	ENG	LEVEL DEPEND. setting It eliminates the detail only in the dark areas when the Y detail is boosted. The higher the number selected, the wider the range across which the detail is eliminated.
MASTER GAMMA	0.35 ⋮ 0.60 ⋮ 0.75	ENG	Master gamma setting 0.01 steps
BLACK STRETCH	ON OFF	ENG	ON/OFF switching for mode which compensates low-illumination black-out
MATRIX TABLE	A B	ENG	Color compensation table selection

<Note>
DARK DTL and LEVEL DEPEND function in a mutually opposite way: LEVEL DEPEND is automatically set to 0 when DARK DTL is set to a value other than 0; and DARK DTL is automatically set to 0 when LEVEL DEPEND is set to a value other than 0.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

HIGH SETTING Screen

This page sets the high level.

```
- HIGH SETTING -

MASTER GAIN   :18dB
H.DTL LEVEL   :10
V.DTL LEVEL   :08
DTL CORING    :10
H.DTL FREQ.   :04
DARK DTL      :00
LEVEL DEPEND  :05
MASTER GAMMA  :0.60
BLACK STRETCH:OFF
MATRIX TABLE  :A
```

Item	Variable range	VF display	Remarks
MASTER GAIN	−3 dB ⋮ 18 dB ⋮ 30 dB	ENG	Gains of −3, 0, 3, 6, 9, 12, 15, 18, 21, 24 and 30 dB (S. H. GAIN) can be set.
H.DTL LEVEL	0 ⋮ 10 ⋮ 31	ENG	H.DTL (detail) level setting
V.DTL LEVEL	0 ⋮ 8 ⋮ 31	ENG	V.DTL (detail) level setting
DTL CORING	0 ⋮ 10 ⋮ 15	ENG	DTL coring setting
H.DTL FREQ.	1 ⋮ 4 5	ENG	H.DTL frequency selection 1: 2.5 MHz 4: 4 MHz 2: 3 MHz 5: 4.5 MHz 3: 3.5 MHz
DARK DTL	0 ⋮ 5	ENG	Dark detail setting It boosts the detail of the black areas.
LEVEL DEPEND.	0 ⋮ 5	ENG	LEVEL DEPEND. setting It eliminates the detail only in the dark areas when the Y detail is boosted. The higher the number selected, the wider the range across which the detail is eliminated.
MASTER GAMMA	0.35 ⋮ 0.60 ⋮ 0.750	ENG	Master gamma setting 0.01 steps
BLACK STRETCH	ON OFF	ENG	ON/OFF switching for mode which compensates low-illumination black-out
MATRIX TABLE	A B	ENG	Color compensation table selection

<Note>
DARK DTL and LEVEL DEPEND function in a mutually opposite way: LEVEL DEPEND is automatically set to 0 when DARK DTL is set to a value other than 0; and DARK DTL is automatically set to 0 when LEVEL DEPEND is set to a value other than 0.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

LEVEL 1/6 Screen

This page performs the camera setup level 1 settings.

```
- LEVEL 1/6 -

·C DTL COMPE.   :OFF
 CHROMA DTL     :00
 C DTL CORING   :00
 KNEE APERTURE  :ON
 SLIM DTL       :OFF
 SUPER COLOR    :ON
 CORNER DTL     :OFF
```

Item	Variable range	VF display	Remarks
C DTL COMPE.	ON OFF	ENG	Chroma DTL ON/OFF switching
CHROMA DTL	0 ⋮ 15	ENG	Chroma DTL setting*
C DTL CORING	0 ⋮ 15	ENG	Chroma DTL CORING setting
KNEE APERTURE	ON OFF	ENG	Knee aperture ON/OFF switching Detail above the knee point is boosted.
SLIM DTL	ON OFF	ENG	ON/OFF switching for mode which narrows detail
SUPER COLOR	ON OFF	ENG	ON/OFF switching for color dynamic range expansion
CORNER DTL	ON OFF	ENG	ON/OFF switching for mode which increases edge resolution

*It detects the chroma edge and places on Y to boost the H detail. The higher the number selected, the greater the compensation.

LEVEL 2/6 Screen

This page performs the camera setup level 2 settings.

```
- LEVEL 2/6 -

·SKIN TONE HUE    :103
 SKIN TONE LEVEL  :25
 SKIN TONE WIDTH  :15
 SKIN TONE CORING :15
 SKIN TONE ZEBRA  :OFF
```

Item	Variable range	VF display	Remarks
SKIN TONE HUE	103 ⋮ 143	ENG	Skin tone hue setting (This sets the phase of the skin tone detection range.) It changes the hue in the phase direction.
SKIN TONE LEVEL	1 ⋮ 25 ⋮ 50	ENG	Skin tone level setting (This sets the intensity of the colors in the skin tone detection range.) It changes the level in the amplitude direction.
SKIN TONE WIDTH	1 ⋮ 15 ⋮ 30	ENG	Skin tone width setting*
SKIN TONE CORING	0 ⋮ 15	ENG	Skin tone coring setting This changes the amount of SKIN TONE range detail.
SKIN TONE ZEBRA	ON OFF	ENG	Skin tone zebra ON/OFF switching This sets ZEBRA in the SKIN TONE range to ON or OFF. This changes the coring in the range across which ZEBRA can be seen.

*This sets the range of the colors handled as the skin tone on the basis of the colors set by SKIN TONE HUE and LEVEL. The higher the number selected, the wider the skin tone range.

<Note>
Only numbers are displayed while the variable range of any item except SKIN TONE ZEBRA ON/OFF is being changed.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

LEVEL 3/6 Screen

This page performs the camera setup level 3 settings.

```
- LEVEL 3/6 -

·M.PED              :+000
 SET UP             :7.5%
 MANUAL KNEE        :ON
 KNEE POINT         :197
 KNEE SLOPE         :12
 WHITE CLIP         :ON
 WHITE CLIP LEVEL   :254
```

Item	Variable range	VF display	Remarks
M.PED	−128 ⋮ +000 ⋮ +127	ENG	M.PED (Master pedestal level) setting
SET UP	0% 7.5%	ENG	Setup level switching
MANUAL KNEE	ON OFF	ENG	Mode setting when AUTO KNEE switch is set to OFF
KNEE POINT	197 ⋮ 219	ENG	Manual knee point position setting
KNEE SLOPE	0 ⋮ 12 ⋮ 25	ENG	Manual knee inclination setting
WHITE CLIP	ON OFF		White clip ON/OFF switching
WHITE CLIP LEVEL	214 ⋮ 254		White clip level setting

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

LEVEL 4/6 Screen

This page performs the camera setup level 4 settings.

```
- LEVEL 4/6 -

 R FLARE  :---
   FLARE  :---
   FLARE  :---
   GAMMA  :+00
   GAMMA  :+00
```

Item	Variable range	VF display	Remarks
R FLARE	00 ⋮ 100	ENG	Rch flare setting The preset value differs according to the camera.
G FLARE	00 ⋮ 100	ENG	Gch flare setting The preset value differs according to the camera.
B FLARE	00 ⋮ 100	ENG	Bch flare setting The preset value differs according to the camera.
R GAMMA	−15 ⋮ +00 ⋮ +15	ENG	Rch gamma compensation value for the master gamma.
B GAMMA	−15 ⋮ +00 ⋮ +15	ENG	Bch gamma compensation value for the master gamma.

<Note>
The R FLARE, G FLARE and B FLARE will not be initialized even when the initialization (default setting) operation is performed.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

LEVEL 5/6 Screen

This page performs the camera setup level 5 settings.

```
- LEVEL 5/6 -

 MATRIX TABLE  :A
 MATRIX R-G    :+10
 MATRIX R-B    :+10
 MATRIX G-R    :+10
 MATRIX G-B    :+10
 MATRIX B-R    :+10
 MATRIX B-G    :+10
```

Item	Variable range	VF display	Remarks
MATRIX TABLE	A B	ENG	Color adjustment table selection
MATRIX R–G	−31 ⋮ +10 ⋮ +31	ENG	Color adjustment
MATRIX R–B	−31 ⋮ +10 ⋮ +31	ENG	Color adjustment
MATRIX G–R	−31 ⋮ +10 ⋮ +31	ENG	Color adjustment
MATRIX G–B	−31 ⋮ +10 ⋮ +31	ENG	Color adjustment
MATRIX B–R	−31 ⋮ +10 ⋮ +31	ENG	Color adjustment
MATRIX B–G	−31 ⋮ +10 ⋮ +31	ENG	Color adjustment

<Note>
The white balance and black balance remain unchanged even when the MATRIX items are changed.

The underlined setting in the Variable range column indicates the preset mode.

<Note>
All settings are "00" for the preset mode of MATRIX TABLE B.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

LEVEL 6/6 Screen

This page performs the camera setup level 6 settings.

```
- LEVEL 6/6 -

H PHASE COARSE    :07
H PHASE FINE      :128
SC PHASE COARSE   :0
SC PHASE FINE     :128
A.IRIS LEVEL      :078
A.IRIS PEAK/AVE   :059
A.IRIS MODE       :NORM1
S.IRIS LEVEL      :073
```

Item	Variable range	VF display	Remarks
H PHASE COARSE	0 ⋮ <u>7</u> ⋮ 15	ENG	H phase rough adjustment during GENLOCK mode.
H PHASE FINE	0 ⋮ <u>128</u> ⋮ 255	ENG	H phase fine adjustment during GENLOCK mode.
SC PHASE COARSE	<u>0</u> ⋮ 3	ENG	SC phase rough adjustment during GENLOCK mode.
SC PHASE FINE	0 ⋮ <u>128</u> ⋮ 255	ENG	SC phase fine adjustment during GENLOCK mode.
A.IRIS LEVEL	0 ⋮ <u>78</u> ⋮ 100	ENG	Auto iris target value setting The brightness (iris) is controlled using this value. The higher the number selected, the greater the brightness.
A.IRIS PEAK/ AVE.	0 ⋮ <u>59</u> ⋮ 100	ENG	Auto iris peak: average value ratio setting The closer the selected value is to 0, the greater the tendency toward AVE control; the closer the selected value is to 100, the greater the tendency toward PEAK control.
A.IRIS MODE	<u>NORM1</u> NORM2 CENTR	ENG	Auto iris mode selection NORM1: Light metering over entire screen (except for edges). NORM2: Light metering over entire screen (except for top). CENTR: The light is measured only at the screen center.
S.IRIS LEVEL	0 ⋮ <u>73</u> ⋮ 100	ENG	Super iris target value setting (Backlight compensation mode)

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

VF OPERATION Screen

This page performs the viewfinder display settings.

```
- VF OPERATION -

VF OUT            :Y
VF DTL            :2
ZEBRA1 DETECT     :070
ZEBRA2 DETECT     :085
ZEBRA2            :SPOT
```

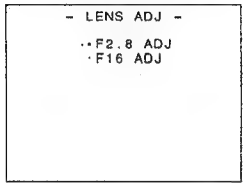
Item	Variable range	VF display	Remarks
VF OUT	<u>Y</u> NAM R G B	ENG	VF OUT selection NAM (N Additive Mix): Signals with the highest level among R, G and B are output.
VF DTL	0 ⋮ <u>2</u> ⋮ 4	ENG	VF DTL selection The detail of the VF signals is further boosted. At the "0" setting, the detail is the same as the main line.
ZEBRA1 DETECT	50 ⋮ <u>70</u> ⋮ 110	ENG	ZEBRA1 DETECT level (IRE value) setting
ZEBRA2 DETECT	50 ⋮ <u>85</u> ⋮ 110	ENG	ZEBRA2 DETECT level (IRE value) setting
ZEBRA2	ON OFF <u>SPOT</u>	ENG	ZEBRA2 ON/OFF switching and SPOT selection *When ZEBRA2 is set to SPOT, set the ZEBRA2 DETECT value higher than the ZEBRA1 DETECT value. If the ZEBRA2 DETECT value is less than the ZEBRA1 DETECT value, the ZEBRA pattern will not be displayed.

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

LENS ADJ Screen

This page performs the lens adjustments. The ON/OFF status for each item is indicated by displaying an asterix (•) or period (·) in front of the item on the screen.



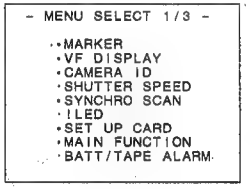
•: ON
·: OFF

Item	Variable range	VF display	Remarks
F2.8 ADJ	——	ENG	Voltage is output only when selected by the cursor (arrow).
F16 ADJ	——	ENG	Voltage is output only when selected by the cursor (arrow).

<Note>
When using a lens which allows the lens iris open or close end to be adjusted, set either "F2.8 ADJ" or "F16 ADJ" to ON and repeatedly adjust the lens iris until it is "F2.8" or "F16", respectively. (Fujinon S18×6.7 BRM4/BERM4 lenses do not have this adjustment function.)

MENU SELECT 1/3 Screen

This page performs the menu page display ON/OFF settings. The ON/OFF status for each item is indicated by displaying an asterix (•) or period (·) in front of the item on the screen.



•: ON
·: OFF

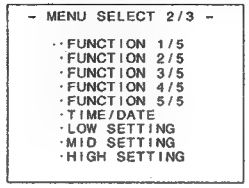
Item	Variable range	VF display	Remarks
MARKER	<u>ON</u> OFF	ENG	MARKER item user menu display ON/OFF
VF DISPLAY	<u>ON</u> OFF	ENG	VF DISPLAY item user menu display ON/OFF
CAMERA ID	<u>ON</u> OFF	ENG	CAMERA ID item user menu display ON/OFF
SHUTTER SPEED	ON <u>OFF</u>	ENG	SHUTTER SPEED item user menu display ON/OFF
SYNCHRO SCAN	<u>ON</u> OFF	ENG	SYNCHRO SCAN item user menu display ON/OFF
!LED	ON <u>OFF</u>	ENG	!LED item user menu display ON/OFF
SET UP CARD	<u>ON</u> OFF	ENG	SET UP CARD item user menu display ON/OFF
MAIN FUNCTION	<u>ON</u> OFF	ENG	MAIN FUNCTION item user menu display ON/OFF
BATT/TAPE ALARM	ON <u>OFF</u>	ENG	BATT/TAPE ALARM item user menu display ON/OFF

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

MENU SELECT 2/3 Screen

This page performs the menu page display ON/OFF settings. The ON/OFF status for each item is indicated by displaying an asterix (•) or period (·) in front of the item on the screen.



•: ON
·: OFF

Item	Variable range	VF display	Remarks
FUNCTION 1/5	ON <u>OFF</u>	ENG	FUNCTION 1/5 item user menu display ON/OFF
FUNCTION 2/5	ON <u>OFF</u>	ENG	FUNCTION 2/5 item user menu display ON/OFF
FUNCTION 3/5	ON <u>OFF</u>	ENG	FUNCTION 3/5 item user menu display ON/OFF
FUNCTION 4/5	ON <u>OFF</u>	ENG	FUNCTION 4/5 item user menu display ON/OFF
FUNCTION 5/5	ON <u>OFF</u>	ENG	FUNCTION 5/5 item user menu display ON/OFF
TIME/DATE	ON <u>OFF</u>	ENG	TIME/DATE item user menu display ON/OFF
LOW SETTING	ON <u>OFF</u>	ENG	LOW SETTING item user menu display ON/OFF
MID SETTING	ON <u>OFF</u>	ENG	MID SETTING item user menu display ON/OFF
HIGH SETTING	ON <u>OFF</u>	ENG	HIGH SETTING item user menu display ON/OFF

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

MENU SELECT 3/3 Screen

This page performs the menu page display ON/OFF settings. The ON/OFF status for each item is indicated by displaying an asterix (•) or period (·) in front of the item on the screen.

```
- MENU SELECT 3/3 -

  ·LEVEL 1/6
  ·LEVEL 2/6
  ·LEVEL 3/6
  ·LEVEL 4/6
  ·LEVEL 5/6
  ·LEVEL 6/6
  ·VF OPERATION
  ·LENS ADJ
```

•: ON
·: OFF

Item	Variable range	VF display	Remarks
LEVEL 1/6	ON OFF	ENG	LEVEL 1/6 item user menu display ON/OFF
LEVEL 2/6	ON OFF	ENG	LEVEL 2/6 item user menu display ON/OFF
LEVEL 3/6	ON OFF	ENG	LEVEL 3/6 item user menu display ON/OFF
LEVEL 4/6	ON OFF	ENG	LEVEL 4/6 item user menu display ON/OFF
LEVEL 5/6	ON OFF	ENG	LEVEL 5/6 item user menu display ON/OFF
LEVEL 6/6	ON OFF	ENG	LEVEL 6/6 item user menu display ON/OFF
VF OPERATION	ON OFF	ENG	VF OPERATION item user menu display ON/OFF
LENS ADJ	ON OFF	ENG	LENS ADJ item user menu display ON/OFF

The underlined setting in the Variable range column indicates the preset mode.

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

AUTO SHADING Screen

This page performs the auto shading settings. Align the arrow with the desired BLACK or WHITE item and press the UP or DOWN button to execute the setting.

```
- AUTO SHADING -

·BLACK
 WHITE(V.SAW)
 BLACK COMPE   :ON
 WHITE COMPE   :ON
```

Item	Variable range	VF display	Remarks
BLACK	—	ENG	Auto black shading (digital) activated
WHITE (V. SAW)	—	ENG	Auto white shading (V. SAW) activated
BLACK COMPE	ON OFF	ENG	Black compensation ON/OFF
WHTE COMPE	ON OFF	ENG	White compensation ON/OFF

The underlined setting in the Variable range column indicates the preset mode.

DATA RESET Screen

This page resets the menu display item settings. Aligning the cursor (arrow) with the item and pressing the UP or DOWN button resets the settings.

```
- DATA RESET -

  ·MENU INIT.
```

Item	Variable range	VF display	Remarks
MENU INIT.	—	ENG	Sets the setting menu to the status when shipped from the factory.

<Note>
The flare compensation value (LEVEL 4/6) and shading compensation value (AUTO SHADING) do not return to the default settings.

DIAGNOSTIC Screen

This page displays the unit's operating conditions and software version.

```
- DIAGNOSTIC -

OPERATION    :00000 ×10h
DRUM RUNNING:00000 ×10h
THREADING    :00000 ×10

VTR SYSCON   :Ver<1.0>
CAM SYSCON   :Ver<1.0>
```

Item	Variable range	VF display	Remarks
OPERATION	—	ENG	Operating time with the power ON
DRUM RUNNING	—	ENG	Drum rotating time
THREADING	—	—	Loading time
VTR SYSCON	—	ENG	Software version display
CAM SYSCON	—	ENG	Software version display

Menu screen display methods
USER menu: Setting the MENU switch to SET displays the USER menu.
ENG menu: Holding down the SHIFT/ITEM and UP buttons simultaneously and setting the MENU switch to SET displays the ENG menu.

Warning System

If trouble is detected immediately after the power is turned on or during operation, the display window (LCD), WARNING lamp, lamps inside the viewfinder, and warning tones from the speaker and earphone inform the operator of trouble.

Item	Display window (LCD)				Lamps		Warning tone	Warning contents	VTR (section) operation	Countermeasures
	Warning display	Warning display status	Remaining battery level display	Remaining tape length display	WARNING lamp	REC lamp				
RF	RF	Lighted *1)			Flashes 4 times per second	Flashes 4 times per second	Emitted 4 times per second *1)	Video head clogging, recording system trouble	Head clogging is detected and a warning tone emitted. Images may not be recorded properly.	Clean the heads. If images still cannot be recorded properly after the heads are cleaned, consult your dealer.
SERVO	SERVO	Lighted			Flashes 4 times per second	Flashes 4 times per second	Emitted 4 times per second	The servo is out of order.	Recording continues, but images may not be recorded properly.	Turn off the power and consult your dealer. (Lamps may flash briefly and then go off when tape running starts, but this does not indicate trouble.)
HUMID	HUMID	Lighted			Lighted	Flashes 4 times per second	Emitted 4 times per second *1) Continuous tone *2)	Condensation	Recording continues, but stops if tape sticking occurs. Playback, fast forward and rewind operation stops.	If tape running stops and the HUMID display does not go off even when the power is turned off and then on again, wait until the display goes off.
SLACK	SLACK	Flashes			Flashes 4 times per second	Flashes 4 times per second	Continuous tone	Tape wind-up trouble	An error code appears in the time code display position of the display window (LCD) and the VTR stops.	Check the error code in the display window (see page 127) and consult your dealer.

*1) During recording
*2) During playback, fast forward or rewind

<Note>
If a cleaning tape is not available to deal with video head clogging, etc., first establish the STOP mode and then press the STOP button again while the RESET button on the side panel is kept depressed. While these buttons are held down, the cleaning roller will clean the heads for a maximum of 10 seconds.

Warning System

Item	Display window (LCD)				Lamps		Warning tone	Warning contents	VTR (section) operation	Countermeasures
	Warning display	Warning display status	Remaining battery level display	Remaining tape length display	WARNING lamp	REC lamp				
TAPE END	E TAPE F	Flashes *1)		1 of the 7 bars displayed: 5-0 display inside the viewfinder flashes	Flashes 1 time per second*1)	Flashes 1 time per second	Emitted 4 times per second	The tape is nearing its end.	Operation continues.	Replace the tape as necessary.
		Flashes		All 7 bars displayed	Lighted	Flashes 4 times per second	Continuous tone	The tape has reached its end.	Recording, playback or fast forward operation stops.	Replace the cassette or rewind the tape.
BATTERY END	E BATT F	Flashes	1 of the 7 bars displayed		Flashes 1 time per second	Flashes 1 time per second	Emitted 4 times per second*1)	The battery has almost run out.	Operation continues.	Replace the battery as necessary.
		Flashes	All 7 bars displayed		Lighted	Flashes 1 time per second	Continuous tone	The battery has run out.	Operation stops.	Replace the battery.

*1) During recording
*2) During playback, fast forward or rewind

<Notes>
- When trouble occurs with the external VTR connected to the unit, warnings are displayed only by the unit's REC and TALLY lamps.
- When connecting the external VTR to the 26-pin output adapter and recording simultaneously with the internal and external VTRs, the REC and TALLY lamps flash if trouble occurs in either VTR. Check the warning displays of each VTR to confirm the error contents.

Warning system priorities are as follows.
1 SLACK
2 BATTERY END
3 TAPE END
4 HUMID
5 SERVO
6 RF
7 BATTERY NEAR END
8 TAPE NEAR END

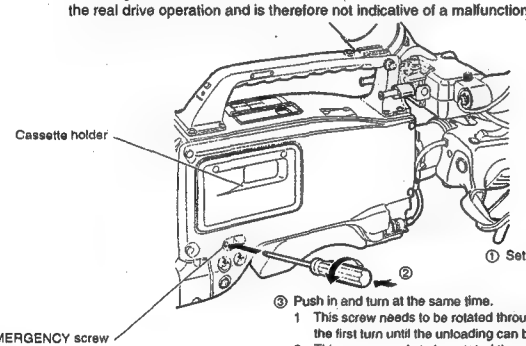
Emergency eject

If the cassette cannot be ejected by pressing the EJECT button, use a screwdriver or similar tool to press and turn the EMERGENCY screw. This enables the cassette to be removed.

1. Set the power to OFF.
2. Remove the rubber cap where shown in the figure. Insert a Phillips head screwdriver into the cross-shaped part of the EMERGENCY screw (red).
3. While pushing in with the screwdriver, turn the EMERGENCY screw counterclockwise until the tape is ejected.
   1 This screw needs to be rotated through about 30 turns after the first turn until the unloading can be started.
   2 This screw needs to be rotated through about 120 turns after the first turn until the tape is ejected.
4. Remove the cassette.
5. Return the rubber cap to its original position.

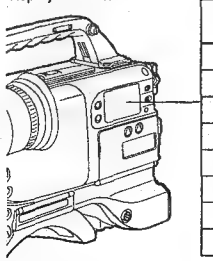
<Notes>

1. Do not turn the EMERGENCY screw except in an emergency.
2. Do not turn the screw clockwise. Stop turning the screw as soon as the tape is ejected. Otherwise, the mechanism may be damaged.
3. After the tape is ejected, the cassette holder will not lock into placed even when an attempt is made to close it. Be sure to turn the power off and turn it back on to reset the mechanism's operation, and then close the cassette holder.
4. A clicking sound will be heard when the EMERGENCY screw is turned: this sound is made by the real drive operation and is therefore not indicative of a malfunction.



Error Codes

When an error occurs in the unit for some reason or other, the following error codes appear in the display window.



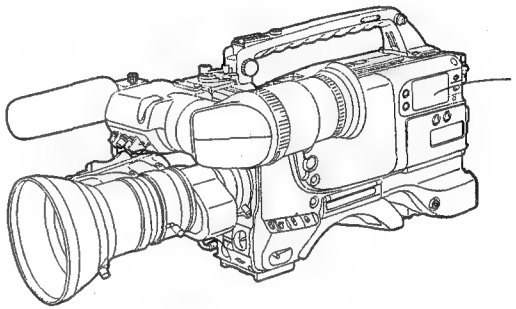
Code No.	Contents
8	Solenoid trouble
9	The servo is not locked.
A	Condensation has occurred.
B	Supply reel trouble
C	Take-up reel trouble
D	Capstan trouble
E	Cylinder trouble
F	Loading trouble

Maintenance

Condensation

If the unit is moved from a cold location to a warm location or used in areas with high humidity, the moisture in the air may adhere as water droplets on the head drum. This is called condensation, and if the tape is run under these conditions, it will easily stick to the drum. Therefore, the following points should be observed.

- If the unit is moved under conditions where condensation may occur, eject the tape.
- Before inserting the tape, set the POWER switch to ON and check that the HUMID display in the display window is not lighted. If the HUMID display is lighted, do not insert the tape until the display goes off.



Cleaning the Video Heads

Use the AJ-CL12MP cleaning cassette when head cleaning is required. Improper use of the cleaning cassette may damage the video heads. Therefore, read the Handling Instructions for the cleaning tape carefully before use.

Cleaning the Viewfinder

- Do not use thinner or other solvents to remove dirt from the viewfinder.
- Wipe the lens with lens cleaner available on the market.
- Absolutely do not wipe the mirror. If dirt, etc. has adhered to the mirror, remove it using a air blower available on the market.

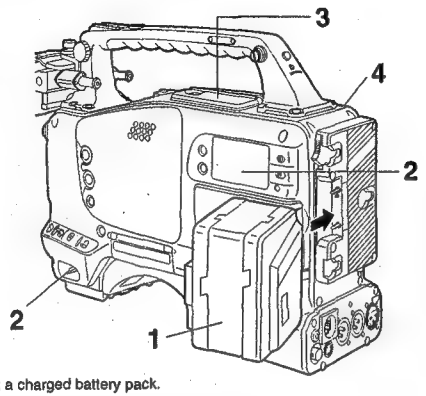
Characteristic Phenomenon of CCD Cameras

Smear

Smear occurs when shooting high-intensity subjects, and occurs more easily as the electronic shutter speed increases.

Perform the following inspections before shooting to check that all systems are operating properly. Checking the image with a color monitor is recommended.

Inspection Preparations



1 Insert a charged battery pack.

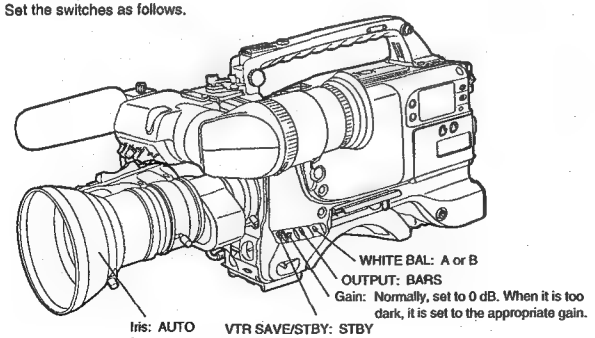
2 Set the POWER switch to ON and check that the HUMID display does not appear and that five or more bars of the remaining battery level display are lighted.
- If the HUMID display appears, wait until the display goes off.
- If five or more bars of the remaining battery level display are not lighted, replace the battery pack with a sufficiently charged battery pack.

3 Check that there are no cables, etc. around the cassette holder and top panel, and then press the EJECT button to open the cassette holder.

4 Check the following items, and then insert a cassette and close the cassette holder.
- The cassette is not set to the write protect status.
- There is no slack in the tape.

Inspecting the Camera Section

Set the switches as follows.



Inspecting the Viewfinder

1 Adjust the position of the viewfinder.

2 Check that the color bar appears on the viewfinder screen, and then adjust the BRIGHT, CONTRAST and PEAKING controls so that the color bar appears clearly on the viewfinder.

3 Check the following items.
(1) Set the MENU SET/OFF switch to SET and check that the setting menu appears on the viewfinder screen.
(2) Press the PAGE button and check that the setting menu page changes.
(3) Press the SHIFT/ITEM switch and check that the cursor moves within the page.
(4) Press the UP or DOWN button to check that the setting or ON/OFF display of the item selected with the cursor changes.

4 Set the OUTPUT/AUTO KNEE switch to CAM and switch the FILTER knob to 1, 2, 3 and 4. Check that the number of the FILTER display on the viewfinder screen changes in accordance with the knob position.

5 Perform the following operations to check that the (!) lamp lights when the items set to ON at the (!) LED page are operated.
(1) Set the gain to any value other than 0 dB with the GAIN switch.
(2) Set the SHUTTER switch to ON.
(3) Set the WHITE BAL switch to PRST.
(4) Insert the lens extender.
(5) Set the FILTER knob to any position other than "1".

6 Press the SHUTTER switch repeatedly from the ON position to the SEL side and check that the shutter setting on the viewfinder screen changes.

7 Aim the lens at an appropriate subject and turn the focus ring to bring the subject into focus. Check the image appearing in the viewfinder.

8 Set both the AUDIO IN CH1 and CH2 switches to FRONT [MIC] and set LEVEL METER on the VF DISPLAY page of the setting menu to ON. Check that the audio level appears on the viewfinder screen when sound is input from the microphone connected to the MIC IN jack on the front panel. Then, check that the audio level disappears from the viewfinder screen when LEVEL METER on the VF DISPLAY page of the setting menu is set to OFF.

9 Check that the zebra pattern appears on the viewfinder screen when the ZEBRA switch is set to ON, and disappears when the ZEBRA switch is set to OFF.

<Note>
The items and functions in steps 3 to 6 may not be displayed or may not operate depending on the setting conditions. Set the unit to engineer mode, set DISPLAY MODE on the VF DISPLAY page of the setting menu to "3", and then set the required items at the SHUTTER SPEED, (!) LED and MENU SELECT 1/3 to 3/3 pages.

Inspecting the Iris and Zoom Functions

1 Set the zoom to electric zoom mode and check the electric zoom operation. Check that the image changes to telephoto and wide angle.

2 Set the zoom to manual zoom mode and check the manual zoom operation. Turn the manual zoom lever and check that the image changes to telephoto and wide angle.

3 Set the iris to automatic adjustment mode and aim the lens at subjects with differing brightness to check that the automatic iris adjustment functions.

4 Set the iris to manual adjustment mode and turn the iris ring to check the manual iris adjustment.

5 Hold down the instant iris automatic adjustment button and aim the lens at subjects with differing brightness to check the instant iris automatic adjustment performance.

6 Return the iris to automatic adjustment mode and change the GAIN switch setting to L, M and H to check the following items.
- The iris is adjusted with respect to subjects with the same brightness in accordance with the switch setting.
- The gain value display on the viewfinder screen changes in accordance with the switch setting.

7 When a lens with an extender is mounted, set the extender to the used position to check that the extender functions properly.

Perform "(1) Tape Running inspections" to "(4) Earphone and Speaker Inspections" below consecutively.

Inspecting the VTR Section

(1) Tape Running Inspections

1 Set the VTR SAVE/STBY switch to SAVE and check that the VTR SAVE lamp inside the viewfinder lights.

2 Set the VTR SAVE/STBY switch to STBY and check that the VTR SAVE lamp goes off.

3 Set the F-RUN/R-RUN switch to R-RUN.

4 Set the DISPLAY switch to CTL.

5 Press the unit's VTR START button and check the following items.
- The tape reels turn.
- The counter display number changes.
- The REC lamp inside the viewfinder lights.
- The RF and SERVO lamps in the display window do not light.

6 Press the unit's VTR START button again. Check that the tape stops and the REC lamp inside the viewfinder goes off.

7 Check the same operations as in steps 5 and 6 using the VTR button of the lens.

8 Press the RESET button and check that the counter display number changes to "00:00:00:00".

9 Set the LIGHT switch to ON and check that the display window is illuminated.

10 Press the REW button and then press the PLAY button after the tape has rewound for a while. Check that the recording, playback and rewind operations are performed properly.

11 Press the FF button and check that fast forward operation is performed properly.

(2) Inspection of Audio Level Automatic Adjustment Functions

1 Set the AUDIO SELECT CH1/CH2 switch to AUTO.

2 Set the AUDIO IN CH1/CH2 switch to FRONT [MIC].

3 Aim a microphone connected to the MIC IN jack at an appropriate sound source and check that the level display for both CH1 and CH2 changes in accordance with the sound level.

(3) Inspection of Audio Level Manual Adjustment Functions

1 Set the AUDIO IN CH1/CH2 switch to FRONT [MIC].

2 Set the AUDIO SELECT CH1/CH2 switch to MAN.

3 Turn the AUDIO LEVEL CH1/CH2 controls and check that the level display increases when the controls are turned to the right.

(4) Earphone and Speaker Inspections

1 Set the VTR SAVE/STBY switch to STBY.

2 Turn the MONITOR control and check that the speaker volume changes.

3 Connect an earphone to the PHONES jack. Check that the sound to the speaker is cut off and that the microphone sound can be heard from the earphone.

4 Turn the MONITOR control and check that the earphone volume changes.

(5) Inspections when Using an External Microphone

1 Connect an external microphone to the AUDIO IN CH1 and CH2 connectors.

2 Set the AUDIO IN CH1/CH2 switch to REAR [MIC].

3 Aim the microphone at a sound source and check that the audio level meter in the display window and the audio level display inside the viewfinder change in accordance with the sound level. Each channel can also be checked separately by connecting a single microphone to each channel.

(6) Time Code and User Bit-Related Inspections

1 Set the user bit as necessary.
- See "Setting the User Bit" (page 77) for a description of setting methods.

2 Set the time code.
- See "Setting the Time Code" (page 76) for a description of setting methods.

3 Set the F-RUN/R-RUN switch to R-RUN.

4 Press the VTR START button.
Check that the tape runs and the counter display number changes.

5 Press the VTR START button again.
Check that the tape stops and the counter display number stops changing.

6 Set the F-RUN/R-RUN switch to F-RUN.
Check that the counter display number changes regardless of the tape running status.

7 Set the DISPLAY switch to UB.
Check that the set user bit is displayed.

SECTION 2

SERVICE INFORMATION

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      How to open the Service Menu 2-7
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1. Setting Menu

This unit has different kinds of setting menus, which are User, Engineer, Service, Design and Option. For operation of User and Engineer menu, please refer to Operating Instructions. When Service or Design menu is opened, User and Engineer menu screen also can be selected as shown as below table. When Option menu is opened, only option menu screen is displayed.

<Table of Setting Menu>

	User	Engineer	Service	Design	Option
MAKER	O	O	O	O	
VF DISPLAY	O	O	O	O	
CAMERA ID	O	O	O	O	
SHUTTER SPEED		O	O	O	
SYNCRO SCAN	O	O	O	O	
! LED		O	O	O	
SET UP CARD	O	O	O	O	
MAIN FUNCTION	O	O	O	O	
BATT/TAPE ARARM		O	O	O	
FUNCTION 1/5		O	O	O	
FUNCTION 2/5		O	O	O	
FUNCTION 3/5		O	O	O	
FUNCTION 4/5		O	O	O	
FUNCTION 5/5		O	O	O	
TIME/DATE		O	O	O	
LOW SETTING		O	O	O	
MID SETTING		O	O	O	
HIGH SETTING		O	O	O	
LEVEL 1/6		O	O	O	
LEVEL 2/6		O	O	O	
LEVEL 3/6		O	O	O	
LEVEL 4/6		O	O	O	
LEVEL 5/6		O	O	O	
LEVEL 6/6		O	O	O	
VF OPERATION		O	O	O	
LENS ADJ		O	O	O	
MENU SELECT 1/3		O	O	O	
MENU SELECT 2/3		O	O	O	
MENU SELECT 3/3		O	O	O	
AUTO SHADING		O	O	O	
DATA RESET		O	O	O	
SERVICE ADJ			O	O	
VTR D/A DATA			O	O	
DESIGN				O	
DIAGNOSTIC		O	O	O	
HOUR METER RESET				O	
SBC OPTION				O	
BATTERY SETTING			O	O	
WHITE SHADING			O	O	
OPTION MENU					O

1-1. Main Menu Data Sheet (Factory Setting)

MENU	ITEM	Factory Setting Data		
		D700AP (D700P)	D700AE (D700E)	D800AE
MARKER Screen	CENTER MARK	ON	ON	ON
	SAFETY ZONE	1	1	1
VF DISPLAY Screen	DISP MODE	3	3	3
	EXTENDER	ON	ON	ON
	SHUTTER	ON	ON	ON
	TAPE	ON	ON	ON
	BETTERY	ON	ON	ON
	FILTER	ON	ON	ON
	WHITE	ON	ON	ON
	GAIN	ON	ON	ON
	LEVEL METER	ON	ON	ON
	IRIS	S+IRIS	S+IRIS	S+IRIS
	CAMERA ID	ON	ON	ON
CAMERA ID Screen	ID : **********	———	———	———
SHUTTER SPEED Screen	SYNCHRO SCAN	ON	ON	ON
	SUPER V	OFF	OFF	OFF
	1/60		ON	ON
	1/100	ON		
	1/120	ON	ON	ON
	1/250	ON	ON	ON
	1/500	ON	ON	ON
	1/1000	ON	ON	ON
	1/2000	ON	ON	ON
SYNCHRO SCAN Screen	SYNCHRO SCAN	1/61.7	1/51.5	1/50.5
! LED Screen	GAIN (0 dB)	ON	ON	ON
	GAIN (-3 dB)	OFF	OFF	OFF
	SHUTTER	ON	ON	ON
	WHITE PRESET	OFF	OFF	OFF
	EXTENDER	ON	ON	ON
	FILTER	OFF	OFF	OFF
	SUPER V	OFF	OFF	OFF
SET UP CARD Screen	READ (→CAM)	———	———	———
	WRITE (→CARD)	———	———	———
	CARD CONFIG.	———	———	———
	ID READ/WRITE	OFF	ON	ON
	FUNC 1~2 R/W	ON	ON	ON
	L/M/H SET R/W	ON	ON	ON
	LEVEL 1~6 R/W	ON	ON	ON
MAIN FUNCTION Screen	PHANTOM FRONT	ON	ON	ON
	PHANTOM CH1	OFF	OFF	OFF
	PHANTOM CH2	OFF	OFF	OFF
BATT/TAPE ALARM Screen	BATT NEAR END	ON	ON	ON
	BATT END	ON	ON	ON
	TAPE NEAR END	ON	ON	ON
	TAPE END	ON	ON	ON

MENU	ITEM	Factory Setting Data		
		D700AP (D700P)	D700AE (D700E)	D800AE
FUNCTION 1/5 Screen	DETAIL	ON	ON	ON
	2D LPF	ON	OFF	OFF
	SKIN TONE DTL	OFF	OFF	OFF
	MATRIX	ON	ON	ON
	GAMMA	ON	ON	ON
	TEST SAW	OFF	OFF	OFF
	FLARE	ON	ON	ON
FUNCTION 2/5 Screen	SUPER V	FRM1	FRM1	FRM1
	FILTER INH	OFF	OFF	OFF
	SHOCKLESS AWB	NORMAL	NORMAL	NORMAL
	S. IRIS SW	S. IRIS	S. IRIS	S. IRIS
	S. SCAN SEL	ON	ON	ON
FUNCTION 3/5 Screen	HUMID OPE	OFF	OFF	OFF
	26P CONTROL	OFF	OFF	OFF
	REC START	NORMAL	NORMAL	NORMAL
	TC MODE	DF		
	UB MODE	USER	USER	USER
	PAUSE TIMER	30	30	30
	BATTERY SEL	NiCd12	NiCd12	NiCd12
	TCG VF DISP	OFF	OFF	OFF
	TCG SET HOLD	OFF	OFF	OFF
	FIRST REC TC	REGEN	REGEN	REGEN
FUNCTION 4/5 Screen	FRONT MIC	-40 dB	-40 dB	-40 dB
	REAR MIC CH1	-60 dB	-60 dB	-60 dB
	REAR MIC CH2	-60 dB	-60 dB	-60 dB
	LINE CH1/CH2	+4 dB	0 dB	0 dB
	REAR AUDIO	STEREO	STEREO	STEREO
	MIC LOWCUT CH1	OFF	OFF	OFF
	MIC LOWCUT CH2	OFF	OFF	OFF
	EMPHASIS	OFF	OFF	OFF
	CUE AUDIO	CH1	CH1	CH1
FUNCTION 5/5 Screen	AUDIO OUT	CH1	CH1	CH1
	LIMITER	ON	OFF	OFF
	TEST TONE	ON	ON	ON
TIME DATE Screen	YEAR	99	99	99
	MONTH	1	1	1
	DAY	1	1	1
	HOUR	0	0	0
	MINUTE	0	0	0
	TIME/DATE SET	———	———	———
LOW SETTING Screen	MASTER GAIN	0 dB	0 dB	0 dB
	H. DTL LEVEL	13	13	13
	V. DTL LEVEL	10	10	10
	DTL CORING	8	3	3
	H. DTL FREQ.	3	3	3
	DARK DTL	0	0	0
	LEVEL DEPEND.	3	1	1

MENU	ITEM	Factory Setting Data		
		D700AP (D700P)	D700AE (D700E)	D800AE
LOW SETTING Screen	MASTER GAMMA	0.60	0.47	0.47
	BLACK STRECH	OFF	OFF	OFF
	MATRIX TABLE	A	A	A
MID SETTING Screen	MASTER GAIN	9 dB	9 dB	9 dB
	H. DTL LEVEL	13	13	13
	V. DTL LEVEL	10	10	10
	DTL CORING	8	5	5
	H. DTL FREQ.	3	3	3
	DARK DTL	0	0	0
	LEVEL DEPEND.	3	3	3
	MASTER GAMMA	0.60	0.47	0.47
	BLACK STRECH	OFF	OFF	OFF
	MATRIX TABLE	A	A	A
HIGH SETTING Screen	MASTER GAIN	18 dB	18 dB	18 dB
	H. DTL LEVEL	10	10	10
	V. DTL LEVEL	8	8	8
	DTL CORING	10	8	8
	H. DTL FREQ.	4	3	3
	DARK DTL	0	0	0
	LEVEL DEPEND.	5	5	5
	MASTER GAMMA	0.60	0.55	0.55
	BLACK STRECH	OFF	OFF	OFF
	MATRIX TABLE	A	B	B
LEVEL 1/6 Screen	C DTL COMPE.	OFF	OFF	OFF
	CHROMA DTL	0	0	0
	C DTL CORING	0	0	0
	KNEE APERTURE	ON	ON	ON
	SLIM DTL	OFF	OFF	OFF
	SUPER COLOR	ON	ON	ON
	CORNER DTL	OFF	OFF	OFF
LEVEL 2/6 Screen	SKIN TONE HUE	103	103	103
	SKIN TONE LEVEL	25	25	25
	SKIN TONE WIDTH	15	15	15
	SKIN TONE CORING	15	15	15
	SKIN TONE ZEBRA	OFF	OFF	OFF
LEVEL 3/6 Screen	M. PED	+000	+006	+006
	SET UP	7.5%		
	MANUAL KNEE	ON	ON	ON
	KNEE POINT	197	197	197
	KNEE SLOPE	12	24	24
	WHITE CLIP	ON	ON	ON
	WHITE CLIP LEVEL	254	244	244
LEVEL 4/6 Screen	R FLARE	00 to 100	00 to 100	00 to 100
	G FLARE	00 to 100	00 to 100	00 to 100
	B FLARE	00 to 100	00 to 100	00 to 100
	R GAMMA	+00	+00	+00
	B GAMMA	+00	+00	+00

MENU	ITEM	Factory Setting Data		
		D700AP (D700P)	D700AE (D700E)	D800AE
LEVEL 5/6 Screen	MATRIX TABLE	A	A	A
	MATRIX R-G	+10	+15	+15
	MATRIX R-B	+10	+07	+07
	MATRIX G-R	+10	+2	+2
	MATRIX G-B	+10	+10	+10
	MATRIX B-R	+10	+15	+15
	MATRIX B-G	+10	+2	+2
LEVEL 6/6 Screen	H PHASE COARSE	7	7	7
	H PHASE FINE	128	128	128
	SC PHASE COARSE	0	0	0
	SC PHASE FINE	128	128	128
	A. IRIS LEVEL	78	63	63
	A. IRIS PEAK/AVE.	59	75	75
	A. IRIS MODE	NORM1	NORM1	NORM1
	S. IRIS LEVEL	73	72	72
VF OPERATION Screen	VF OUT	Y	Y	Y
	VF DTL	2	2	2
	ZEBRA1 DETECT	70	70	70
	ZEBRA2 DETECT	85	85	85
	ZEBRA2	SPOT	SPOT	SPOT
LENS ADJ Screen	F2.8 ADJ	———	———	———
	F16 ADJ	———	———	———
MENU SELECT 1/3 Screen	MARKER	ON	ON	ON
	VF DISPLAY	ON	ON	ON
	CAMERA ID	ON	ON	ON
	SHUTTER SPEED	OFF	OFF	OFF
	SYNCHRO SCAN	ON	ON	ON
	! LED	OFF	OFF	OFF
	SET UP CARD	ON	ON	ON
	MAIN FUNCTION	ON	ON	ON
	BATT/TAPE ALARM	OFF	OFF	OFF
MENU SELECT 2/3 Screen	FUNCTION 1/5	OFF	OFF	OFF
	FUNCTION 2/5	OFF	OFF	OFF
	FUNCTION 3/5	OFF	OFF	OFF
	FUNCTION 4/5	OFF	OFF	OFF
	FUNCTION 5/5	OFF	OFF	OFF
	TIME/DATE	OFF	OFF	OFF
	LOW SETTING	OFF	OFF	OFF
	MID SETTING	OFF	OFF	OFF
	HIGH SETTING	OFF	OFF	OFF
MENU SELECT 3/3 Screen	LEVEL 1/6	OFF	OFF	OFF
	LEVEL 2/6	OFF	OFF	OFF
	LEVEL 3/6	OFF	OFF	OFF
	LEVEL 4/6	OFF	OFF	OFF
	LEVEL 5/6	OFF	OFF	OFF
	LEVEL 6/6	OFF	OFF	OFF
	VF OPERATION	OFF	OFF	OFF

MENU	ITEM	Factory Setting Data		
		D700AP (D700P)	D700AE (D700E)	D800AE
MENU SELECT 3/3 Screen	LENS ADJ	OFF	OFF	OFF
AUTO SHADING Screen	BLACK	———	———	———
	WHITE (V. SAW)	———	———	———
	BLACK COMPE	ON	ON	ON
	WHITE COMPE	ON	ON	ON
DATA RESET Screen	MENU INIT.	———	———	———
DIAGNOSTIC Screen	OPERATION	———	———	———
	DRUM RUNNING	———	———	———
	THREADING	———	———	———
	VTR SYSCON	———	———	———
	CAM SYSCON	———	———	———

1-2. Service Menu.

< How to open Service Menu >

Pressing SHIFT 、UP and DOWN button on the Right Side Panel simultaneously, set Menu switch to SET side to open the Service Menu.

Procedure, how to change setting on each item, how to select item and how to move Page up and down, is exactly same method as User and Engineer menu.

Service menu has 4 kinds of menu screens. And basically Service menu is for service personal who is trained.

Please refer to Adjustment procedures for detail of use.

[SERVICE ADJ MENU SCREEN]

SERVICE ADJ

GAMMA(SERV)	:	ON
R GAMMA(SERV)	:	-----
B GAMMA(SERV)	:	-----
TEST PULSE	:	OFF
ECU CONNECT	:	ECU
CONCEAL	:	ON
INNER ECC	:	ON
OUTER ECC	:	ON
IF ADJ	:	OFF
SERVO MODE	:	ATF

This menu is for setting

ITEM	RANGE	PRESET	REMARK
GAMMA (SERV)	ON/OFF	ON	GAMMA setting becomes effective.
R GAMMA (SERV)	-10～+10		Setting of Rch GAMMA.
B GAMMA (SERV)	-10～+10		Setting of Bch GAMMA.
TEST PULSE	ON/OFF	OFF	TEST PULSE becomes available.
ECU CONNECT	ECU/EVR	ECU	ECU: Connection with ECU connector. EVR: Connection with EVR connector.
CONCEAL	ON/OFF	ON	
INNER ECC	ON/OFF	ON	
OUT ECC	ON/OFF	ON	
IF ADJ	ON/OFF	OFF	Turn ON when adjusting VTR I/F.
SERVO MODE	ATF/CTL	ATF	Selection of SERVO MODE.

[VTR D/A DATA MENU SCREEN]

VTR D/A DATA

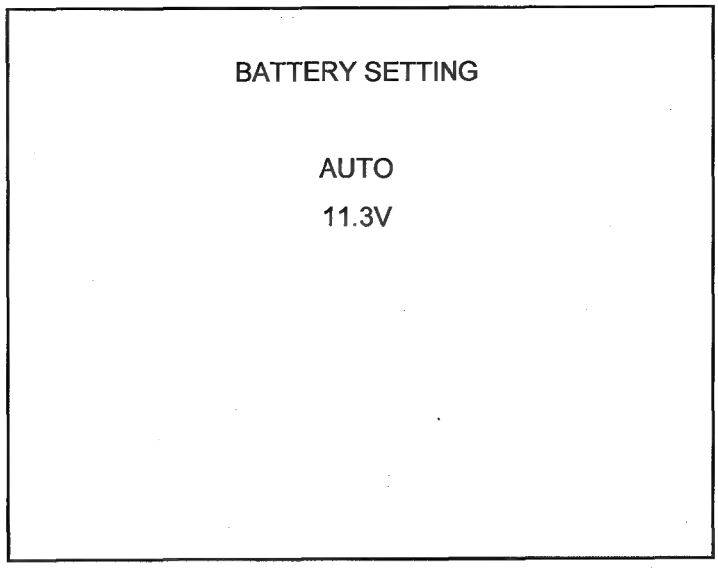
(01) 98	(02) 78	(03) 7C	(04) E4
(05) 00	(06) 00	(07) 8F	(08) 96
(09) 3F	(0A) 40	(0B) 6D	(0C) 55
(0D) 41	(0E) B1	(0F) 8F	(10) A0
(11) 71	(12) 5E	(13) 60	(14) 00
(15) 00	(16) 00	(17) 00	(18) 00
(19) D0	(1A) 8D	(1B) 74	(1C) 9C
(1D) FF	(1E) 88	(1F) 85	(20) D4
(21) B8	(22) 00	(23) 00	(24) FF

The data, which is adjusted by EVR, is displayed.

Address	Adjustment	P.C.Board
(01)	SYNC_LEVEL	V_MAIN
(02)	Y_LEVEL	V_MAIN
(03)	C_LEVEL	V_MAIN
(04)	FS_12	V_MAIN
(05)	-------	------
(06)	------	------
(07)	EQ_A_L	R F
(08)	EQ_A_R	R F
(09)	EQ_B_L	R F
(0A)	EQ_B_R	R F
(0B)	PLL_VCO	R F
(0C)	ATF_GAIN	R F
(0D)	PLL_SLICE	R F
(0E)	EQ_DELAY	R F
(0F)	PLL_POSITION	R F
(10)	AUTO_EQ	R F
(11)	Y_CLAMP_DC	V_I/F
(12)	Pb_CLAMP_DC	V_I/F

Address	Adjustment	P.C.Board
(13)	Pr_CLAMP_DC	V_I/F
(14)	TEST_4	V_I/F
(15)	TEST_3	V_I/F
(16)	C_LEVEL	V_I/F
(17)	Y_LEVEL	V_I/F
(18)	------	------
(19)	HUE	V_I/F
(1A)	OUT_BIAS	V_I/F
(1B)	PLL_POSITION	V_I/F
(1C)	APC	V_I/F
(1D)	NOT_ADJ_L	V_I/F
(1E)	REC_FREQ_L	R F
(1F)	REC_FREQ_R	R F
(20)	REC_CUR_L	R F
(21)	REC_CUR_R	R F
(22)	------	------
(23)	------	------
(24)	SIG_ON_H	V_MAIN

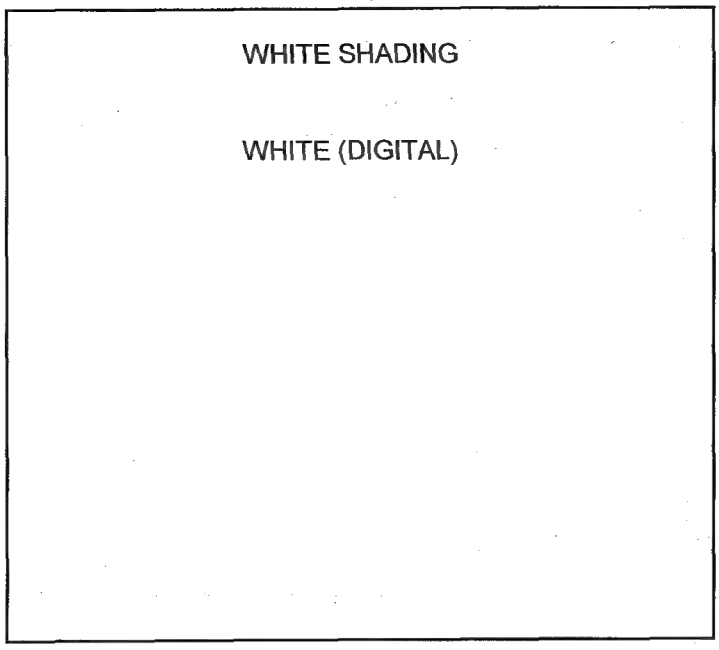
[BATTERY SETTING MENU SCREEN]



The warning is given when the battery voltage becomes less than warning voltage.

ITEM	RANGE	PRESET	REMARK
AUTO / MANUAL	AUTO/MANUAL	AUTO	AUTO : The voltage to detect BATTERY BEFORE END follows the type of Battery as indicated as below.(Battery type is selected by item BATTERY SEL on FUNCTION 3/5 menu screen) Ni−Cd 12V: 11.4V Ni−Cd 13V: 12.5V Ni−Cd 14V: 13.6V IDX L40 : 13.0V L60 : 11.0V L90 : 11.0V Anton-D : 13.4V IDX-D : 13.0V MAMUAL : The voltage to detect BATTERY BEFORE END follows the value of below setting.
BATTERY BEFORE END	11.0V～14.0V	11.3V	Adjusted by 0.1V step.

[WHITE SHADING MENU SCREEN]



AUTO WHITE SHADING can be executed.

ITEM	RANGE	PRESET	REMARK
WHITE(DIGITAL)			Execute the Auto White Shading (Digital).

1-3. Design Menu Screen.

< How to open Design menu >

Pressing SHIFT, UP ,DOWN and PAGE button on the Right Side Panel simultaneously, set the MENU switch to SET position to open Design menu.

Procedure, how to change setting on each item, how to select item and how to move Page up and down, is exactly same method as User and Engineer menu. Design menu has 3 kinds of menu screens. And basically Design menu is for service personal who is trained. Please refer to Adjustment procedure for detail of use.

[DESIGN MENU SCREEN]

DESIGN

H−F COMP	:	ON
MENU ALL INIT.		
Y/C TIMING	:	1
SCH	:	4
DEFECT MODE	:	ON
(STATUS)	:	OFF

Caution: All menu data except Flare and Gamma setting will be reset when UP or DOWN button is pressed at MENU ALL INIT mode.

ITEM	RANGE	PRESET	REMARK
H-F.COMP	ON/OFF	ON	It compensates for the input signal high-pass frequency component.
MENU ALL INIT.	—	—	Reset all data on all menu (refer to above sentence). Also reset OPERATION, DRUM and THEREADING time.
LUMADLY	0-3	0	Y signal is delayed against chroma signal. (At only playback mode)
SCH	0-7	4	SCH adjustment.
DEFECT MODE	ON/OFF	ON	Select the blemish correction mode.
(STATUS)	ON/OFF	—	Display the status of the blemish correction. ON : Corrected some blemish. OFF : Not corrected the blemish.

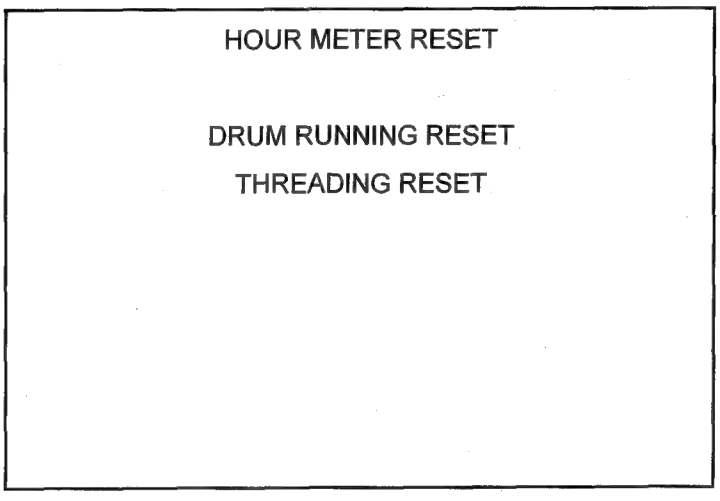
[How to reset the HOUR METER]

DIAGNOSTIC screen displays operating condition and software version as mentioned on Operating Instructions. Drum Running Hours and Threading Times can be reset by HOUR METER RESET menu screen.

< How to reset >

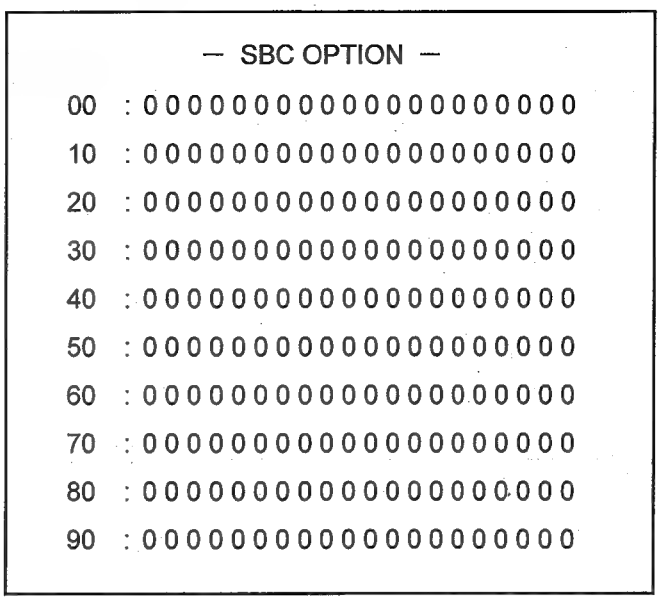
After select the item, press UP or DOWN button, and then execute reset function.

[HOUR METER RESET MENU SCREEN]



ITEM	RANGE	PRESET	REMARK
DRUM RUNNING RESET	—	—	Reset of Drum Running hours.
THREADING RESET	—	—	Reset of loading times.

[SBC OPTION MENU SCREEN]



The data, which are recorded in SBC OPTION area on the tape, are displayed.

ITEM	RANGE	PRESET	REMARK
SBC OPTION	------	------	Display only

1-4. Option Menu Screen.

< How to open Option menu >

Pressing SHIFT and PAGE simultaneously, set Menu switch to SET sides to open Option menu. (Only Option menu displayed)

Procedure, how to change setting item, how to select item and how to move Page up and down, is exactly same method as User and Engineer menu.

OPTION MENU

ENG SECURITY	:	OFF
TONE MODE	:	NORMAL
METER SELECT	:	CH1
VF DISPLAY	:	NORMAL
TC OUT	:	TCG
TCG SET	:	RESET
BER SELECT	:	SMPTE
BATT WARNING	:	ON

ITEM	RANGE	PRESET	REMARK
ENG SECURITY	ON/OFF	OFF	OFF : Engineer、Service and Design menu can be opened. ON : Engineer、Service and Design menu can not be opened. To open those menus turn Power SW OFF under the condition the CAM/BAR SW set BAR side and AWB/ABB SW set to ABB side. Then turn POWER SW ON all menus can be open.
TONE MODE	NORMAL/ALL	NORMAL	NORMAL : The TEST TONE signal output when the CAM/BAR switch is set to BAR and the AUDIO IN switch CH1 is set to FRONT. ALL : The TEST TONE signal output when the CAM/BAR switch is set to BAR.
METER SELECT	CH1/BOTH	CH1	CH1 : Audio LEVEL METER which is displayed on the View Finder is displayed only CH1 BOTH : It displayed both CH1 and Ch2.
VF DISPLAY	NORMAL/ SPECIAL	NORMAL	NORMAL : Status always displayed SPECIAL : Status displayed only MODE CHECK SW set to ON.
TC OUT	TCG、TCG/TCR	TCG	TCG : TCG signal always output TCG/TCR : TCR signal output in V-V mode and TCG signal output in E-E mode.
TCG SET	RESET/HOLD	RESET	TCG operation selection when TCG SET →power OFF→power ON→REC is selected. HOLD : The fact that TCG SET has been selected is stored in the memory when the power is switched off, and regeneration is not performed. RESET : Regeneration is performed without storing the fact that TCG SET has been selected in the memory when the power is switched off.
BAR SELECT	SMPTE/SPLIT	SMPTE	SMPTE : SMPTE color bar. SPLIT : SPLIT color bar
BATT WARNING	ON/OFF	ON	ON : When the unit becomes BATT NEAR END condition, ALARM and TALLY becomes on. OFF : When the unit becomes BATT NEAR END condition, ALARM and TALLY doesn't become on.

<Auto off Information>

Error No.	Meaning	Detected Condition	Check
04	Fault of Pinch Solenoid Drive or Reel Brake Solenoid Drive.	Drive current is supplied to solenoids more than 5 seconds. (Normal : 100 msec.)	1. Drive circuits of S* or T* Brake Solenoids and Pinch Solenoid. P610-#1 and #3, P605, P608, IC501-#99
28	Fault of Cleaner Solenoid Drive	Drive current is supplied to solenoid more than 30 seconds. (Normal : max 10 sec.)	1. Drive circuit of Cleaner Solenoid. IC501-#98
0B	Supply Reel fault	The condition that the amount of tape running is less than one-eighth of specification according to operational mode lasts more than 5 seconds.	1. Reel motor doesn't rotate. →Drive circuit : P614(S*) P615(T*) 2. Reel brake isn't released. →Drive circuit : P605(S*) P608(T*) 3. Cassette is not loaded correctly on a reel. 4. Tape is stacked to drum.
0C	Take-up Reel fault		
0D	Capstan fault	The condition that FG frequency is less than half or more than twice of specification lasts more than 1.5 seconds.	1. Capstan doesn't rotate. →Drive circuit : P616 2. No capstan FG. →P616-#1 and #3
0E	Cylinder fault	The condition that FG frequency is less than half or more than twice of specification lasts more than 3 seconds, even after cylinder has rotated more than 2 seconds.	1. Cylinder doesn't rotate. →Drive circuit : P613 2. No cylinder FG. →P613-#9
0F	Loading fault	Loading or Unloading is not completed within less than 10 seconds.	1. Loading motor doesn't rotate. →Drive voltage P611 2. Take-up reel torque is over specification.

Note : Connectors and ICs are located on Servo board.
S* : Supply Reel
T* : Take-up Reel
: Pin No.

SECTION 3

MAINTENANCE/DISASSEMBLY PROCEDURES & MECHANICAL ADJUSTMENT

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1. Maintenance Parts
1-1. Maintenance Schedule

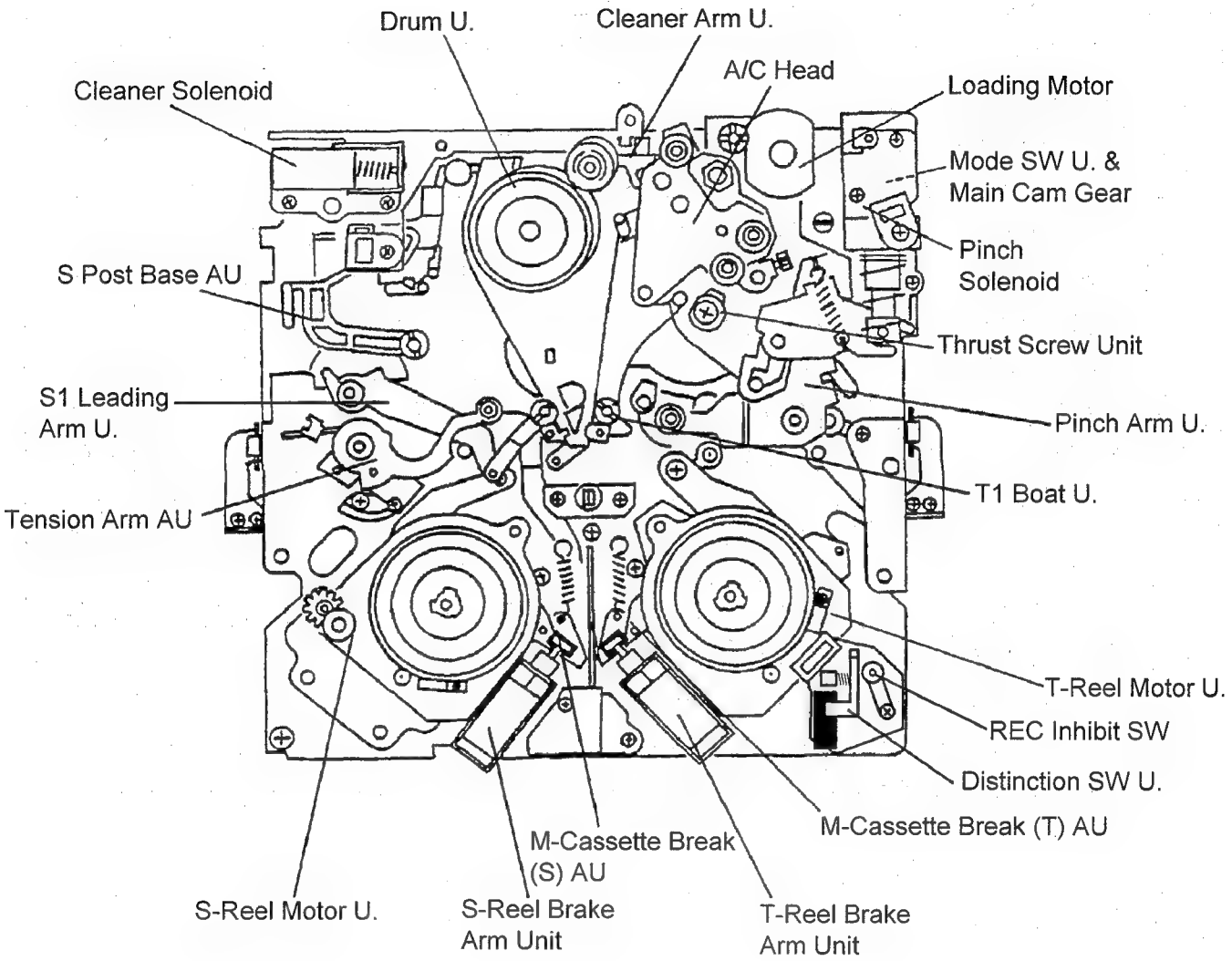
No.	Name	Part Number	Using Hours (hrs) 2,000	4,000	6,000	8,000	10,000	12,000
	Tape Path Cleaning		△Clean the Tape Path at each 500 hours					
1	Cylinder Unit	VEG1498	●	●	●	●	●	◎
2	Pinch Arm Unit	VXL2835		●■		●■		◎
3	Cleaning Arm Unit	VXL2924	●	●	●	●	●	◎
4	S Reel(Rotor Unit)	VEM0629			●			◎
5	T Reel(Rotor Unit)	VEM0630			●			◎
6	S Brake Arm Unit	VXL2705			●			◎
7	T Brake Arm Unit	VXL2706			●			◎
8	Thrust Screw Unit	VXQ0556			●▲			◎
9	Mech Chassis Unit (NTSC)	VXY1308						●
10	Mech Chassis Unit (PAL)	VXY1229						●
11	1.5" CRT(EVF)	M04KYS07WB	Replace the CRT at each 5,000 hours ***Operation Time.***					

The EVF (No.10 : 1.5" CRT) is not mounted with AJ-D700A/D800A.

Note: Hours of Use are based on the head rotation hours.
Hours of Use are recommendation. It may depend on temperature, humidity or dusty.
Hours of Use are listed as the reference of maintenance. They do not mean guarantee hours.

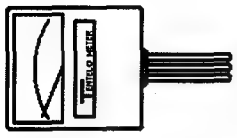
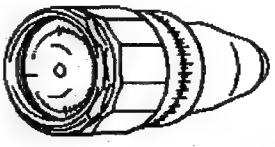
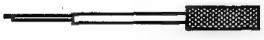
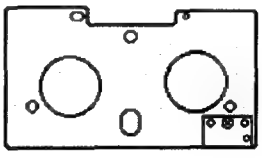
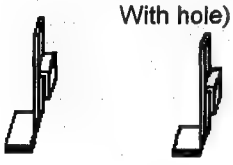
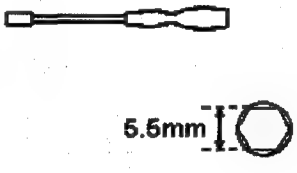
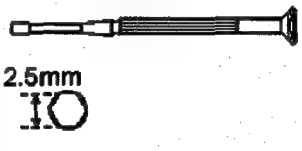
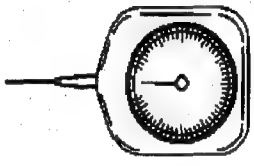
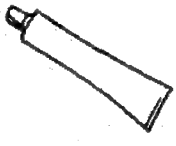
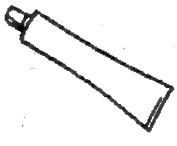
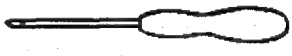
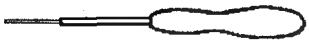
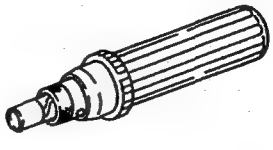
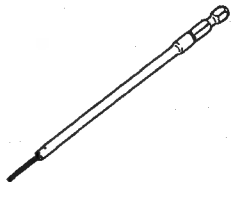
Symbol	Maintenance	Remark
●	Replacement	
◎	Replacement	These parts included in Mech Chassis Unit
■	Greasing	Wipe the old grease and apply new grease
△	Cleaning	This mark means cleaning is necessary
▲	Lubrication	The lubrication is necessary

2. Parts Location

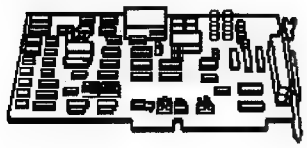


3. JIG & TOOLS

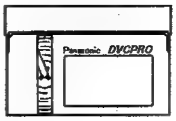
Fig	ITEM	PART No.	JIG & EQUIPMENT	AJ-D810	AJ-D750	Remark
1		VFK1145	Back Tension Meter (T2-M30-P)	yes	yes	
2		VFK1149	Post Driver	yes	yes	
3		VFK71	Dial Torque Gauge (150g)	yes	yes	
4		VFK1191	Dial Torque Gauge (45g)	yes	yes	
5		VFK1152	Dial Torque Gauge Adaptor	yes	yes	
6		VFK0357	Eccentric Screwdriver (1.5)	yes	yes	
7		VFK1154	Post Height Fixture	yes	yes	
8		VFK1153	Mech. Neutral Plate (Post)	yes	yes	
9		VFK0906	Oil	yes	yes	
10		VFK1155	REV Position Tool (Silver)	yes	yes	
11		VFK1156	PLAY Position Tool (Black)	yes	yes	
12		VFK1208	Neutral Position Tool (Black With Hole)	yes	yes	
13		VFK1150	Nut Driver (5.5mm)	yes	yes	
14		VFK1151	Nut Driver (2.5mm)	yes	yes	
15		VFK1188	Dial Tension Gauge (30g)	yes	yes	
16		VFK0948	Check Light	yes	yes	
17		VFK0749	Froiral Grease (for plastic)	yes	yes	
18		MOR265	Morlytone Grease (for metal)	yes	yes	
19		VFK1146	Philips Driver (Fine) (00-75)	yes	yes	
20		VFK1147	Philips Driver (Fine) (0-100)	yes	yes	
21		VFK1148	Hex. Driver (1.5)	yes	yes	
22		VFK1178	Hex. Driver (0.89)	yes	yes	
23		VFK1179	Hex. Driver (0.71)	yes	yes	
24		VFK1190	HEX. Wrench	yes	yes	
25		VFK1209	Torque Driver (0.4-3Kg)	yes	yes	
26		VFK1375	Post Axis Driver (1.5mm)	yes	yes	Instead of VFK0912
27		VFK1300	A/D Board (DAQ-12, Quatech)	yes	yes	Purchase locally
28		VFM3580KM	Alignment Tape (No. 1) : NTSC	yes	yes	
29		VFM3581KM	Alignment Tape (No. 2) : NTSC	yes	yes	
30		VFM3582KM	Alignment Tape (No. 3) : NTSC	yes	yes	
31		AJ-CL12MP	Cleaning Tape	yes	yes	SALES
32		VFK1481	LISTA Software	yes	yes	
33		VFK1186	LISTA CABLE	yes	yes	
34		VFK1194	EXTENSION BOARD	yes	no	
35		VFK1192	F EXTENSION BOARD	no	yes	
36		VFK1193	H EXTENSION BOARD	no	yes	
37		VFK1162	EVR Tool Software	yes	no	
38		VFK1158	B.E.R. Counter Tool	yes	no	
39		VFK1185	B.E.R. Counter Cable	yes	no	
40		VFKW1000AA	EVR I/F Box Unit	yes	no	
41		VFKW1000C	EVR RS232C Cable	yes	no	
42		VFK1180	EVR SUB I/F Unit	yes	no	
43		VFK1187	EVR Cable	yes	no	
44		VFK1210	Multi-Canon Cable	yes	no	
45		VFK0369	Tweezers	yes	yes	
46		VFK0371	Radio Prier	yes	yes	
47		VFK0372	Cutter Prier	yes	yes	
48		VFK0338	Trimmer Adjustment Driver	yes	yes	
49		VFK0337	Philips Driver	yes	no	
50		VFK1423	Tape Big/End Det. Cassette	yes	yes	
51		VFM3680KM	Alignment Tape (No. 1) : PAL	yes	yes	
52		VFM3681KM	Alignment Tape (No. 2) : PAL	yes	yes	
53		VFM3682KM	Alignment Tape (No. 3) : PAL	yes	yes	

1 VFK1145 Back Tension Meter  Model:T2-M30-P	2 VFK1149 Post Driver 	3 VFK71 (150g) 4 VFK1191(45g) Dial Torque Gauge 	5 VFK1152 Dial Torque Gauge Adapter
6 VFK0357(ϕ 1.5) Eccentric Screwdriver 	7 VFK1154 Post Height Fixture 	8 VFK1153 Mech Neutral Plate(Post) 	9 VFK0906 OIL
10 VFK1155 (REV, Silver) 11 VFK1156 (PLAY, Black) 12 VFK1208(Neutral,Black With hole)  (Gold) (Black)	13 VFK1150 Nut Driver(5.5mm)  5.5mm	14 VFK1151 Nut Driver(2.5mm)  2.5mm	15 VFK1188(30g) Dial Tension Gauge 
16 VFK0948(or purchase locally) Check Light 	17 VFK0749 Froiral Grease(White) (for plastic part) 	18 MOR265 Morlytone Grease(Black) (for metal part) 	19 VFK1146 (00 x 75) 20 VFK1147 (0 x 100) Philips Driver 
21 VFK1148(1.5mm) 22 VFK1178(0.89mm) 23 VFK1179(0.71mm) Hex. Driver 	24 VFK1190 (1.5mm) Hex. Wrench 	25 VFK1209 Torque Driver(0.4-3Kg) 	26 VFK1375 Post Axis Driver(1.5mm) 

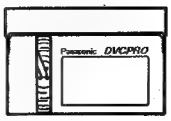
27 VFK1300
A/D Converter Board
(For Quatech. DAQ-12 Purchase Locally)



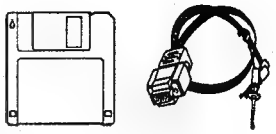
28 VFM3580KM
29 VFM3581KM
30 VFM3582KM
DVC PRO Alignment Tape (NTSC)



31 AJ-CL12MP
Cleaning Tape



32 VFK1159
LISTA Software
33 VFK1186
LISTA Cable



34 VFK1194
Extension Board

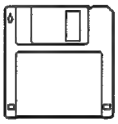
Use for AJ-D700

35 VFK1192 ---(F)
36 VFK1193 ---(H)
Extension Board

(F) (H)

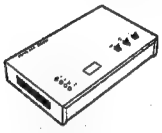
Use for AJ-D750

37 VFK1162
EVR Tool Software



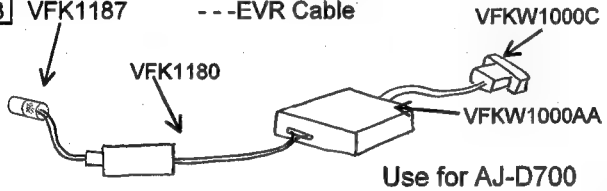
Use for AJ-D700

38 VFK1158
B.E.R. Counter Tool
39 VFK1185
B.E.R. Counter Cable



Use for AJ-D700

40 VFKW1000AA ---EVR I/F Box Unit
41 VFKW1000C ---EVR RS232C Cable
42 VFK1180 ---EVR SUB I/F Unit
43 VFK1187 ---EVR Cable

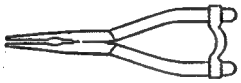


Use for AJ-D700

44 VFK1210
Multi-Canon Cable

45 VFK0369
Tweezers

46 VFK0371
Radio Prier

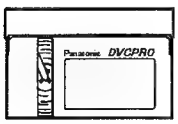


47 VFK0372
Cutter Prier

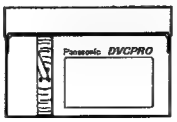
48 VFK0338
Trimmer Adjustment Driver

49 VFK0337
Philips Driver

50 VFK1423
Tape Big/End Det. Cassette



51 VFM3680KM
52 VFM3681KM
53 VFM3682KM
DVC PRO Alignment (PAL)



4. Recommended Test and Service Equipment

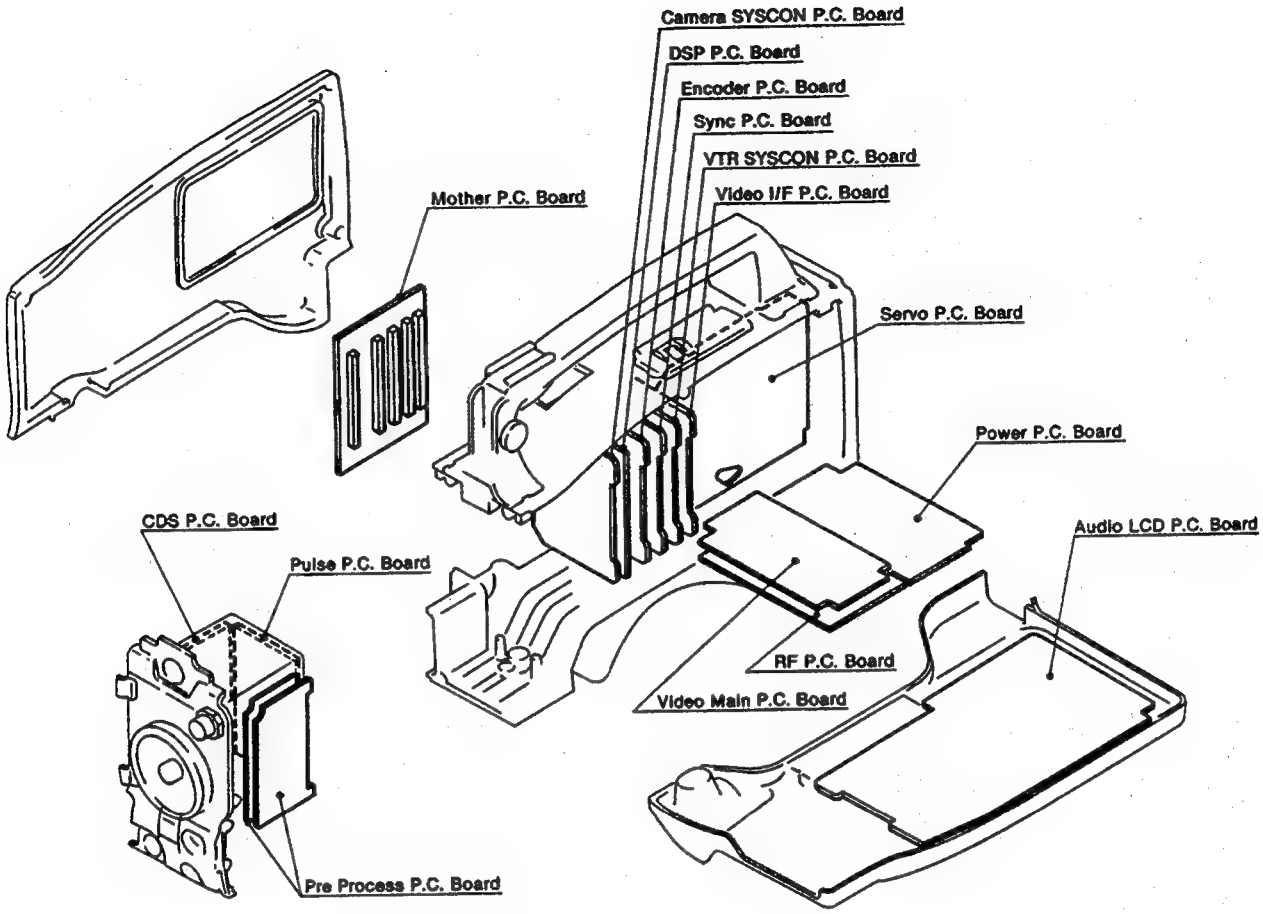
NTSC

Part No.	Name	Remark
TSG130A(OP.04)	Analog Component Signal Generator	TEKTRONIX
	Oscilloscope	TEKTRONIX
1760(OP.SC) or 1780R	Waveform / Vector Monitor	TEKTRONIX
	Digital Volt Meter	
	Frequency Counter	
	VTVM	
	Distortion Meter	
	CR Oscillator	

PAL

Part No.	Name	Remark
TSG131A(OP.04)	Analog Component Signal Generator	TEKTRONIX
	Oscilloscope	TEKTRONIX
1751(OP.SC) or 1781R	Waveform / Vector Monitor	TEKTRONIX
	Digital Volt Meter	
	Frequency Counter	
	VTVM	
	Distortion Meter	
	CR Oscillator	

5. Boards Location



6. Alignment Tapes

DVCPRO Alignment Tape

VFM3580KM (NTSC)

Time	Video		PCM		CUE	
(min)	Signal	Purpose	Signal	Purpose	Signal	Purpose
0:00	Color Bar SMPTE(75%)	Composite Video Level Confirmation	1kHz - 20dB	Audio Level Confirmation	1kHz 0VU	CUE Level Confirmation
7:00	Color Bar Full Field(75%)	Component Video Level Confirmation				
14:00	H Sweep	Frequency Response			6kHz 0VU	A/C Head Azimuth
18:00	Bowtie(500k)	Y/C Timing				
22:00	Pulse&Bar	Y/C Timing			-10dB, 1kHz 50Hz~15kHz	Frequency Response
26:00 30:00	Area Markers					

VFM3581KM (NTSC)

Time(min)	Signal
0:00~20:00	ITI Pattern

VFM3582KM (NTSC)

Time(min)	Signal
0:00~10:00	X Value

VFM3680KM (PAL)

Time	Video		PCM		CUE	
(min)	Signal	Purpose	Signal	Purpose	Signal	Purpose
0:00	Color Bar 100%	Video Level Confirmation	1kHz -18dBu	Audio Level Confirmation	1kHz Reference level	CUE Level Confirmation
10:00	H Sweep	Frequency Response				
14:00	Area Markers				6kHz Reference level	A/C Head Azimuth
18:00	Bowtie(500k)	Y/C Timing				
22:00	Pulse & Bar	Y/C Timing			1kHz 300Hz~6kHz	Frequency Response
26:00 30:00	Multi Pulse	Y/C Timing				

VFM3681KM (PAL)

Time (min)	Signal
0:00 ~ 20:00	ITI Pattern

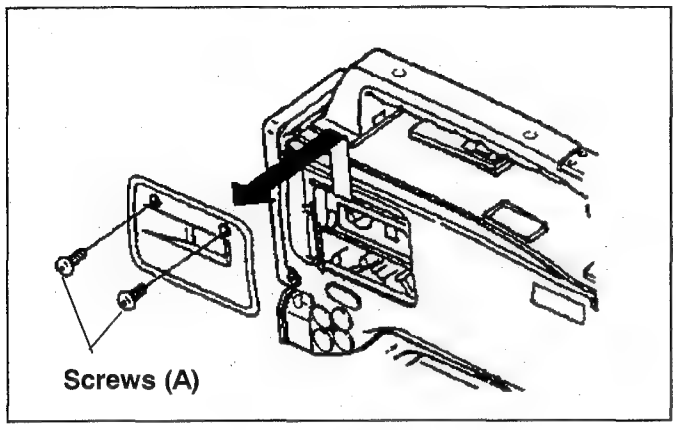
VFM3682KM (PAL)

Time (min)	Signal
0:00 ~ 10:00	X Value

7. Disassembly Procedures

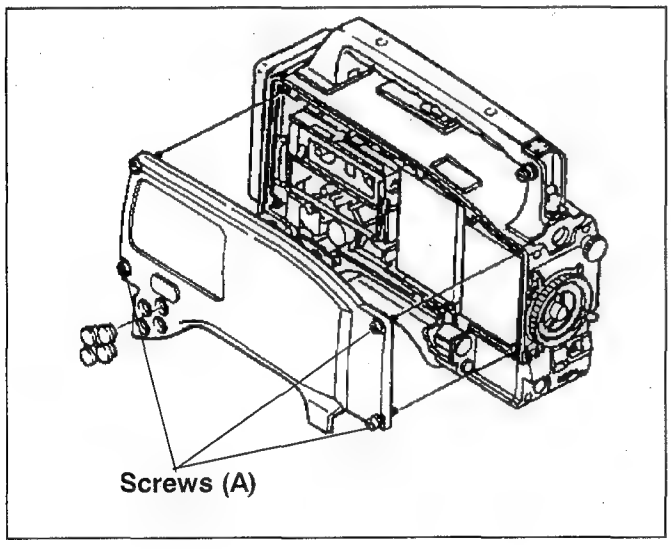
7-1. Removal of Cassette Cover

Remove the 2 screws (A). Slide the cover upward and remove it.



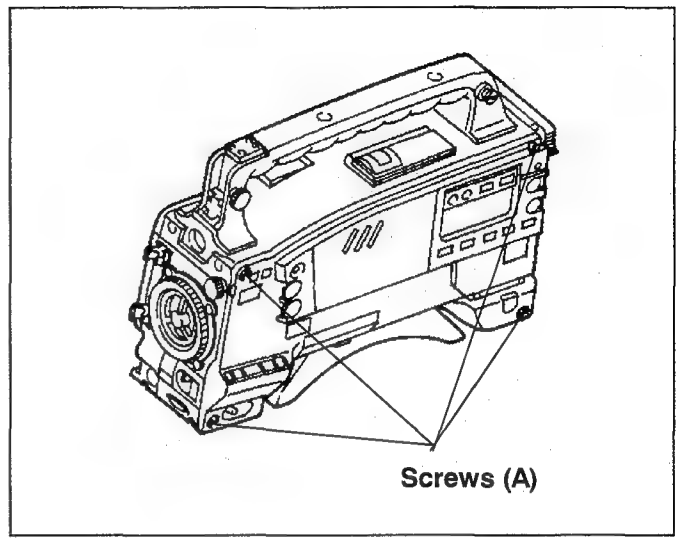
7-2. Removal of Left Side Panel

After removing the cassette cover according to item 7-1., loosen the 4 screws (A) and remove the panel.

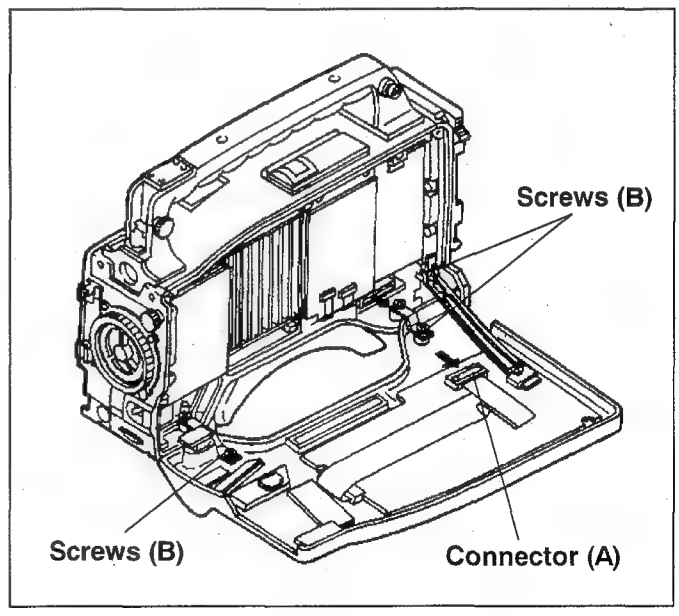


7-3. Removal of Right Side Panel

Loosen the 4 screws (A) and remove the panel.

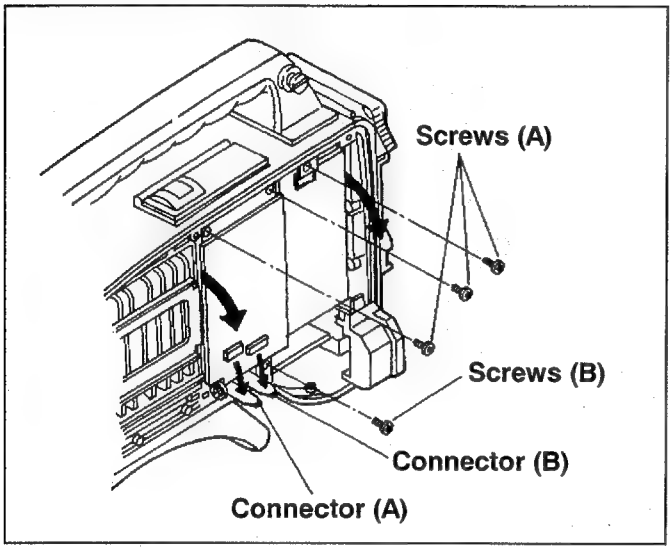


Remove the 3 screws (B) and disconnect the connector(A), then remove the Right Side Panel.

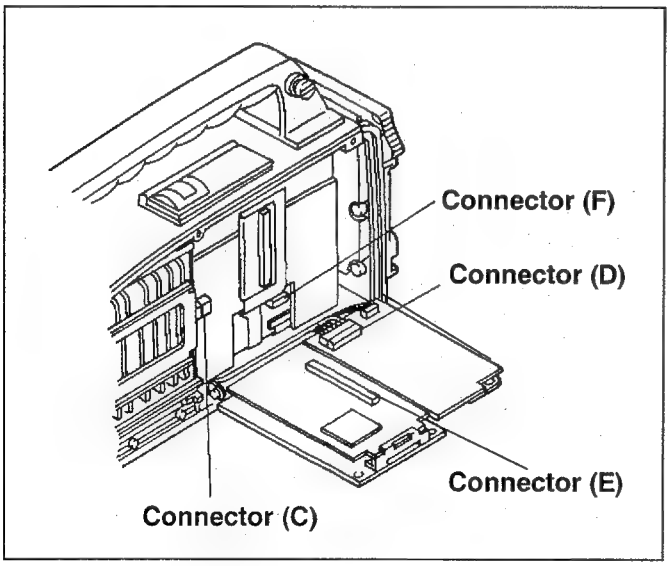


7-4. Removal of Mechanical Chassis Unit

After removing the right side panel according to item 7-3., disconnect the connectors (A) and (B) on the RF P.C.Board. Remove the 3 screws (A) and the screw (B) and lay down the boards.

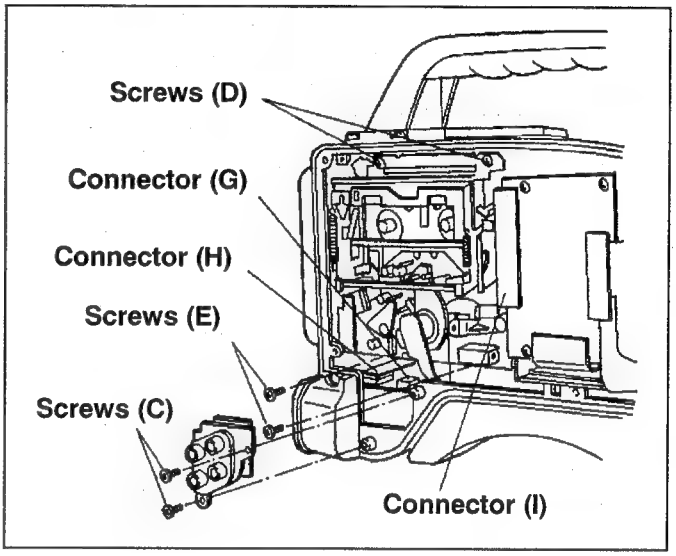


Disconnect the connectors (C), (D),(E) and (F).



After removing the left side panel according to item 7-2., remove the 2 screws (C) for pull out BNC terminal and disconnect the connector (G) and (H) on the Rear Jack P.C.Board. Disconnect the connector (I) on the Mother P.C.Board. and loosen the 2 screws (D) and remove the 2 screws (E).

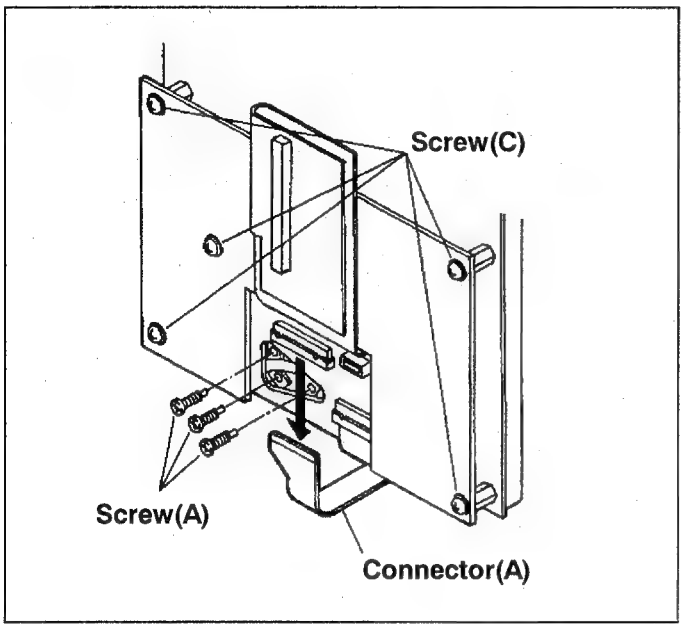
Remove the mechanical chassis with care not to scratch the any connectors and cables.



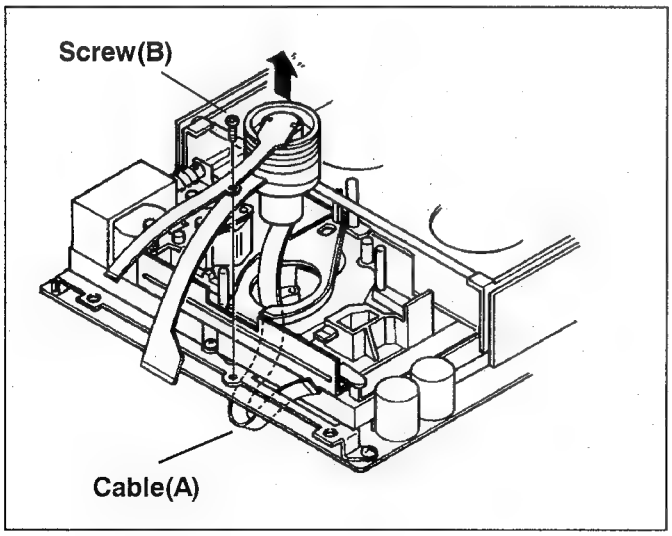
Note : When the mechanical chassis unit installed, confirm the connector P1001 on the Rear Jack P.C.Board connected correctly.

7-5. Removal of Drum Unit

After removing the mechanical chassis according to 7-4, Lift up the flexible cable for remove the 3 screws as shown as below figure. Disconnect the connector (A) and the 3 screws (A).

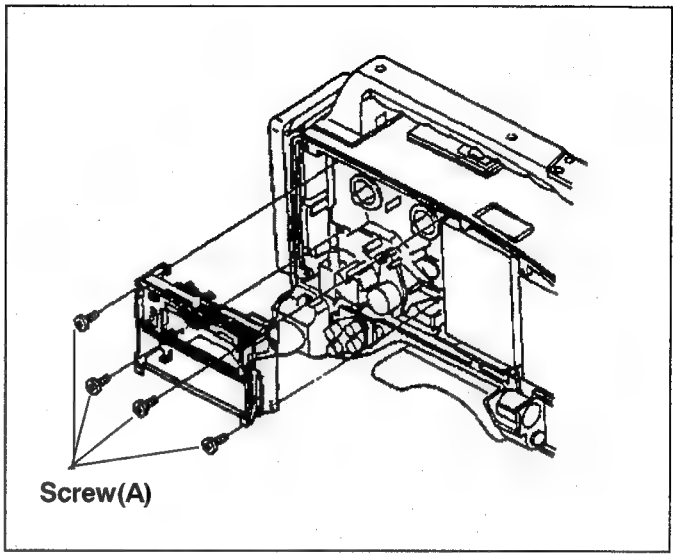


Remove the 2 screws and remove the T1 Guide. Remove the screw (B) and the drum unit with care not to scratch the cable (A).



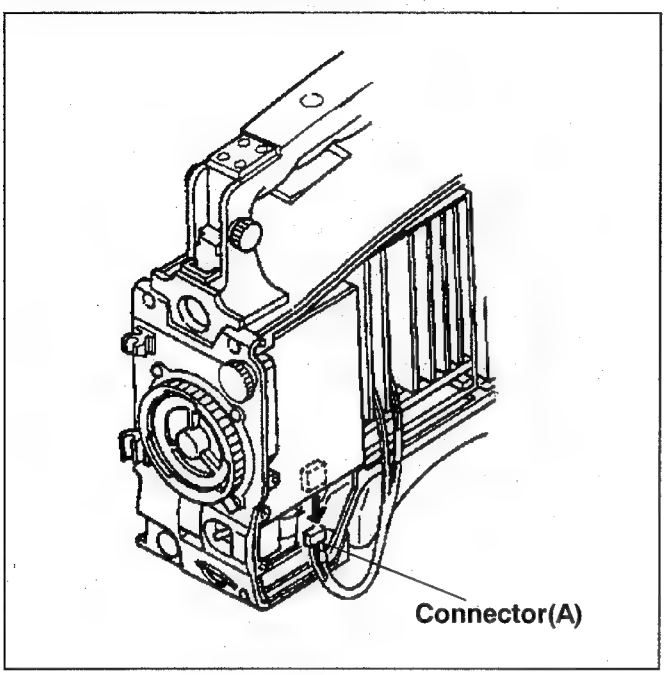
7-6. Removal of Cassette Up Unit

After removing the left side panel according to 7-2., loosen the 4 screws (A) and remove the panel.

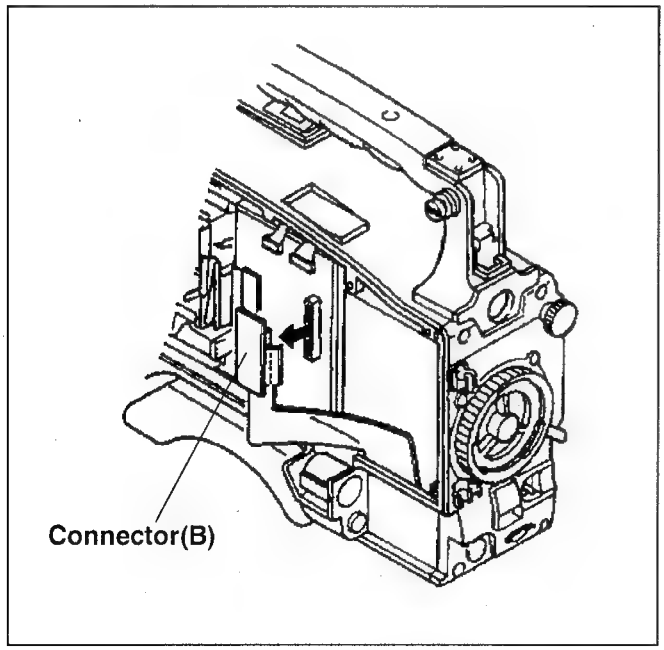


7-7. Removal of Camera Unit

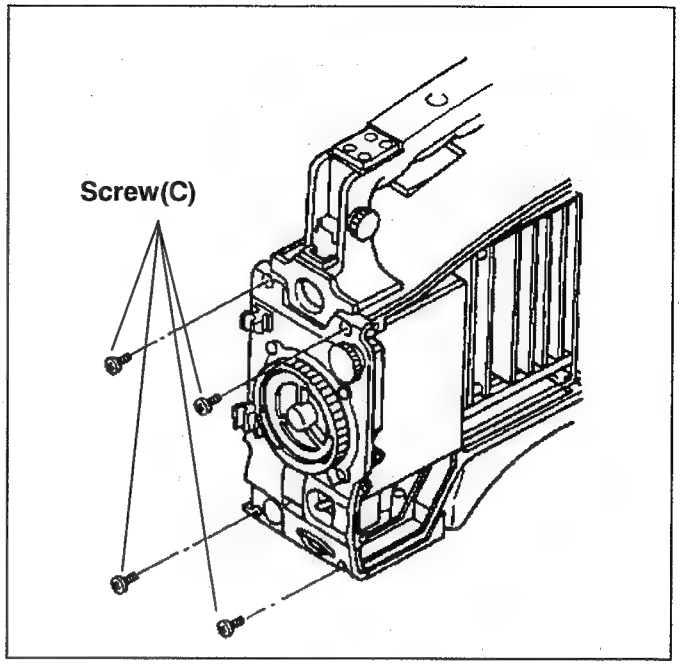
After removing the both panels according to item 7-2. and 7-3., disconnect the connector (A).

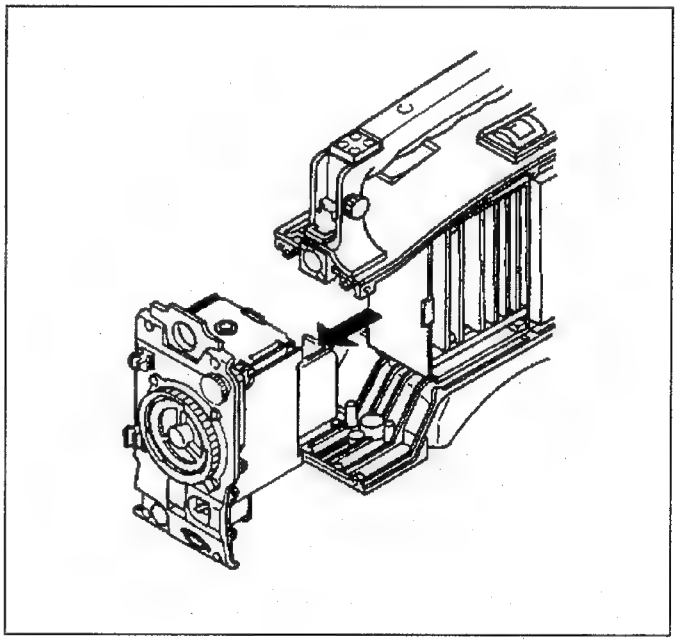


Disconnect the connector (B).



Remove the 4 screws (C) and pull out the camera unit.

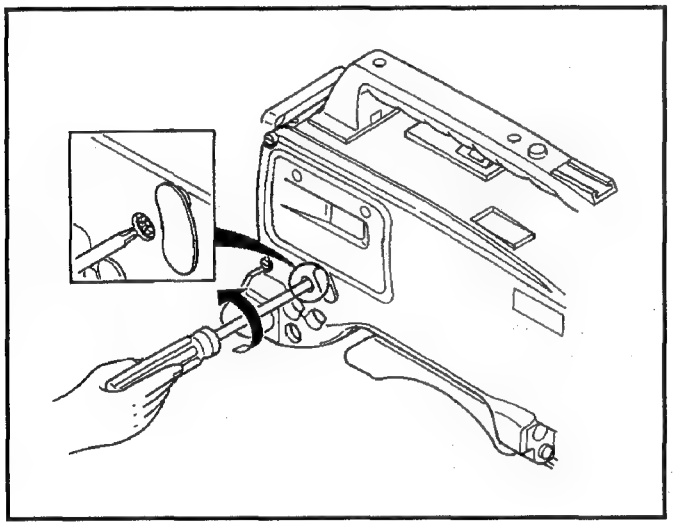




8. Emergency Eject

If the cassette tape cannot be ejected with pressing EJECT button or the cassette tape may be damaged by ejecting it, the cassette tape should be ejected out by the following steps.

1. Turn the power off.
2. Open the rubber cap above the GEN LOCK IN connector. Push in and rotate the red screw counterclockwise.
3. The tape is unloaded with click.
4. Continue until the cassette tape is ejected.

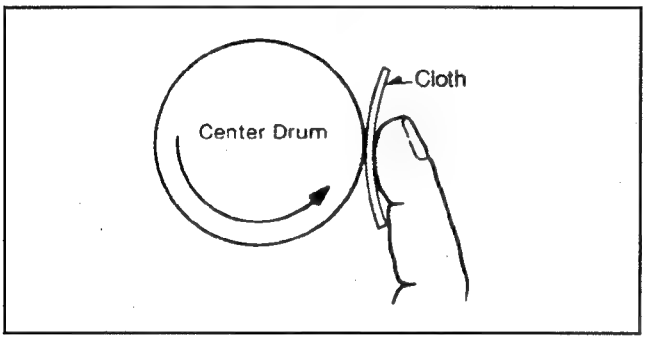


9. Cleaning Procedures

Make sure the power is OFF before cleaning. Use ethanol(more than 99%) as cleaning liquid.

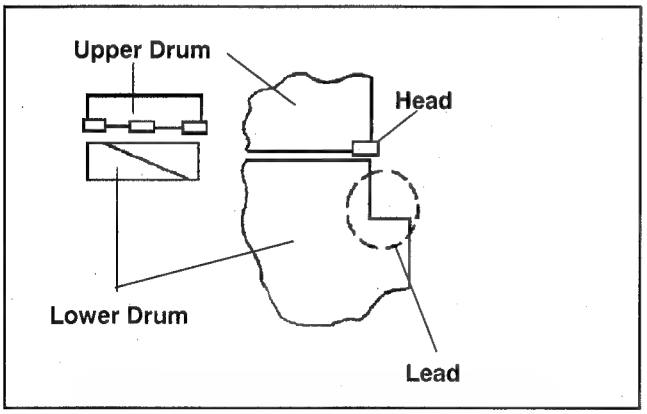
9-1. Cleaning of Head Chips : (Daily)

Clean heads by applying even pressure and rotating cylinder a few times. Never wipe in up and down motion. Never touch a cylinder by naked hand. First wipe with a cloth soaked by cleaning liquid. Then wipe with dry cloth.



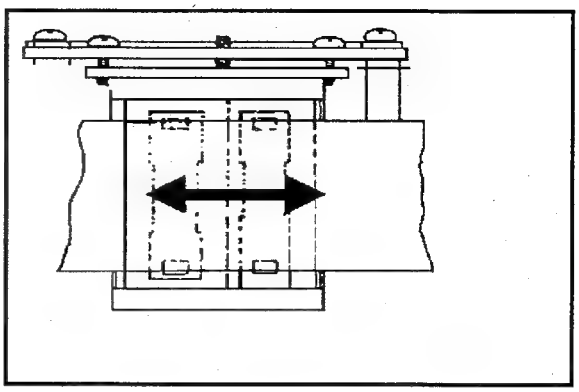
9-2. Cleaning of Drum Lead : (Weekly)

Be careful not to touch a head chip. Clean the drum lead with a pick.



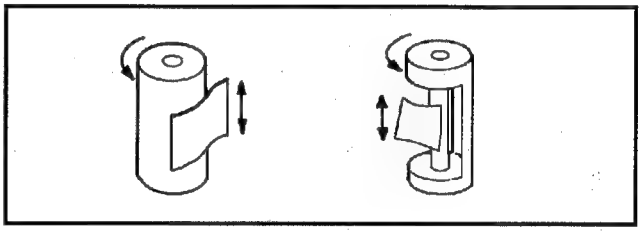
9-3. Cleaning of A/C Head : (Weekly)

Wipe the A/C head with a cloth soaked by cleaning liquid. Wipe again with a dry cloth.



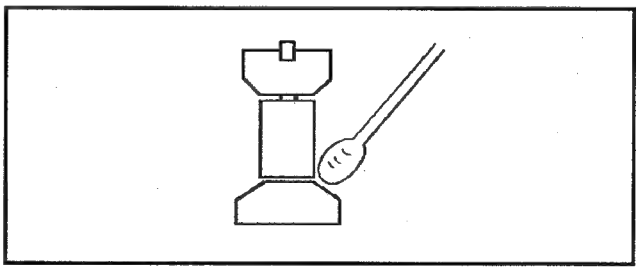
9-4. Cleaning of Pinch Roller and Capstan : (Weekly)

Wipe the Pinch Roller and Capstan with a cloth soaked by cleaning liquid.



9-5. Cleaning of Post : (Weekly)

Wind a cloth on a pick. Wipe each post dry with that pick . Wipe again with a dry cloth. For metal posts wipe with cleaning liquid. Then wipe dry again.



NOTE:

The Cleaning Cloth can be ordered as spare part. The Part number indicated as below.

CLEANING CLOTH : VZZ0095

10. Mechanical Parts Replacement and Adjustment Procedures

General

When mechanical parts are replaced, pay attention to the following notes.

1. Turn power off before replacing any part.
2. If any adjustment is required after replacing parts, perform the required adjustments.
3. Use proper fixture tools.
4. Make sure to clean the parts after replacement, Also when the mechanical parts are replaced, follow the replacement procedure.

10-1. Drum Unit Replacement

(Removal)

1. Remove the T1 Guide and Cleaning Arm Unit (Refer to item 10-8).
2. After removing the mechanical chassis according to item 11-4., disconnect the **connector (A)** and the **3 screws (A)**.

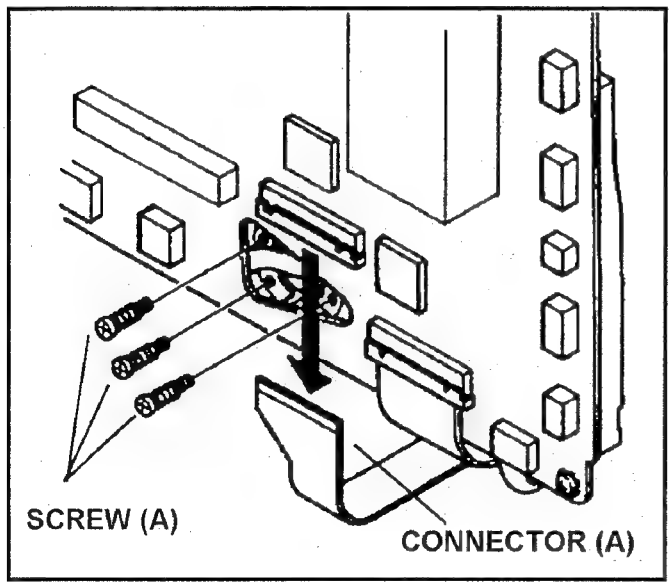


Fig. 10-1

Remove **the screw (B)** and the drum unit with care not to scratch **the cable (A)**.

Note: Be careful when removing the flexible cable from the connector. Refer to the way to remove the connector as shown in Figure 10-1-4.

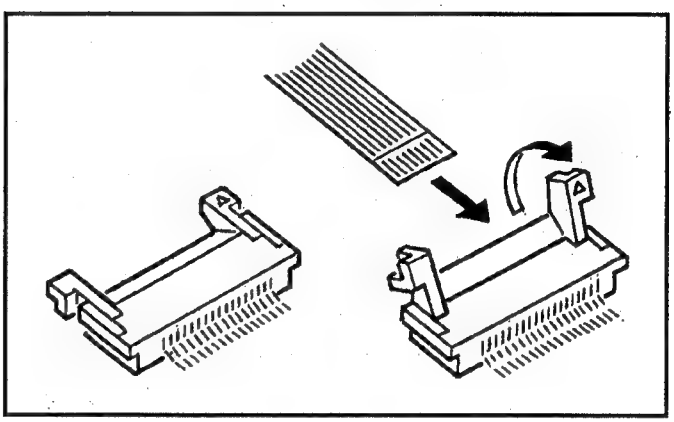


Fig. 10-1-4

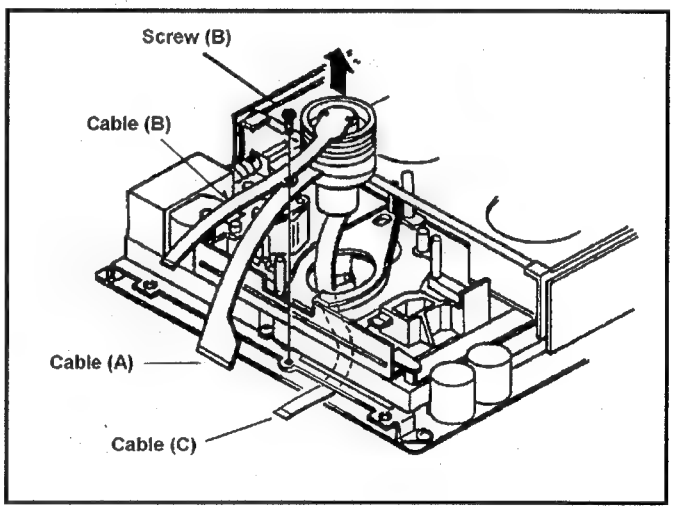


Fig. 10-1-2

Note: Never touch the cylinder with a finger directly when pulling out the Cylinder Unit.

(Installation)

1. Install the new Cylinder Unit according to the opposite procedures to removing.
2. After installing T1 Guide, T1 Guide position adjustment should be performed (Refer to item 10-8-1).

Note: When installing the Cylinder Unit, the pin on Mech. Chassis should match hole of Cylinder Unit as shown in Figure 10-1-3.

Note: Please put **the flexible (B)** and **(C)** between **copper shield plate (D)** and **(E)** as shown in Figure 10-1-5.

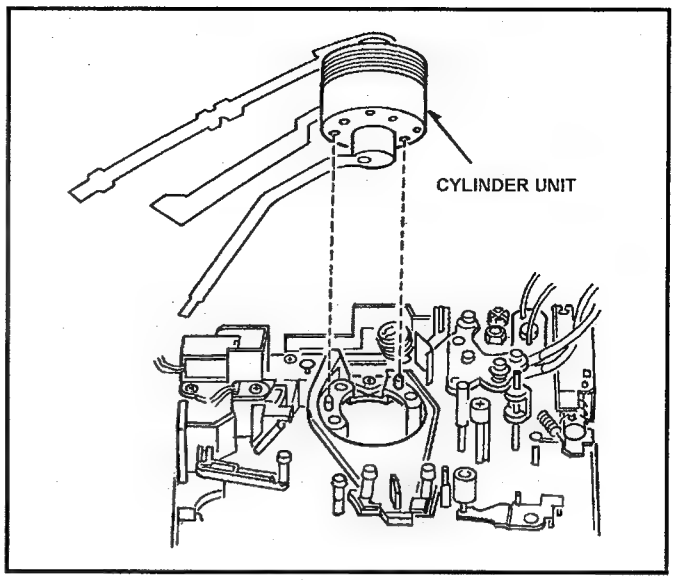


Fig. 10-1-3

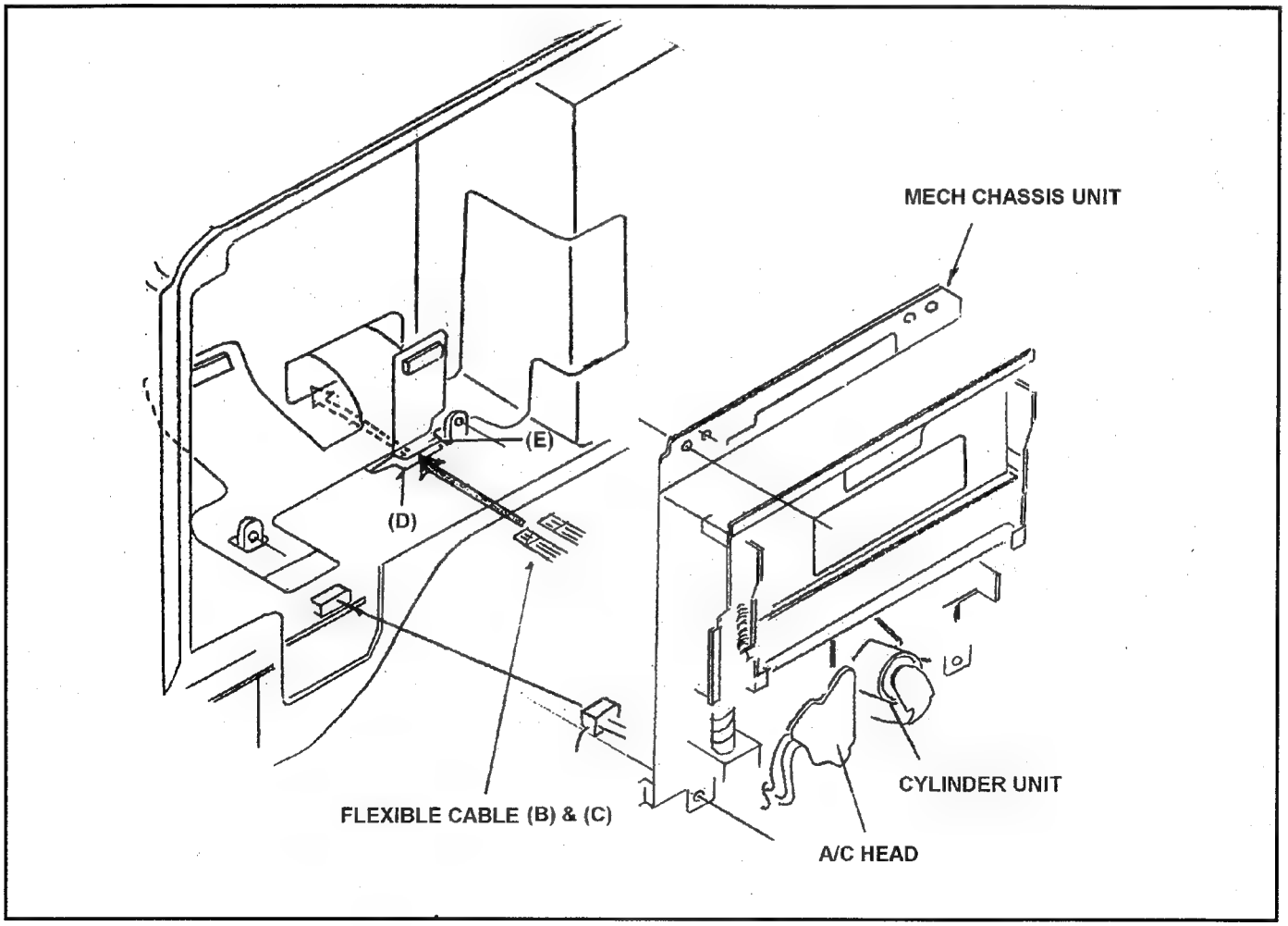


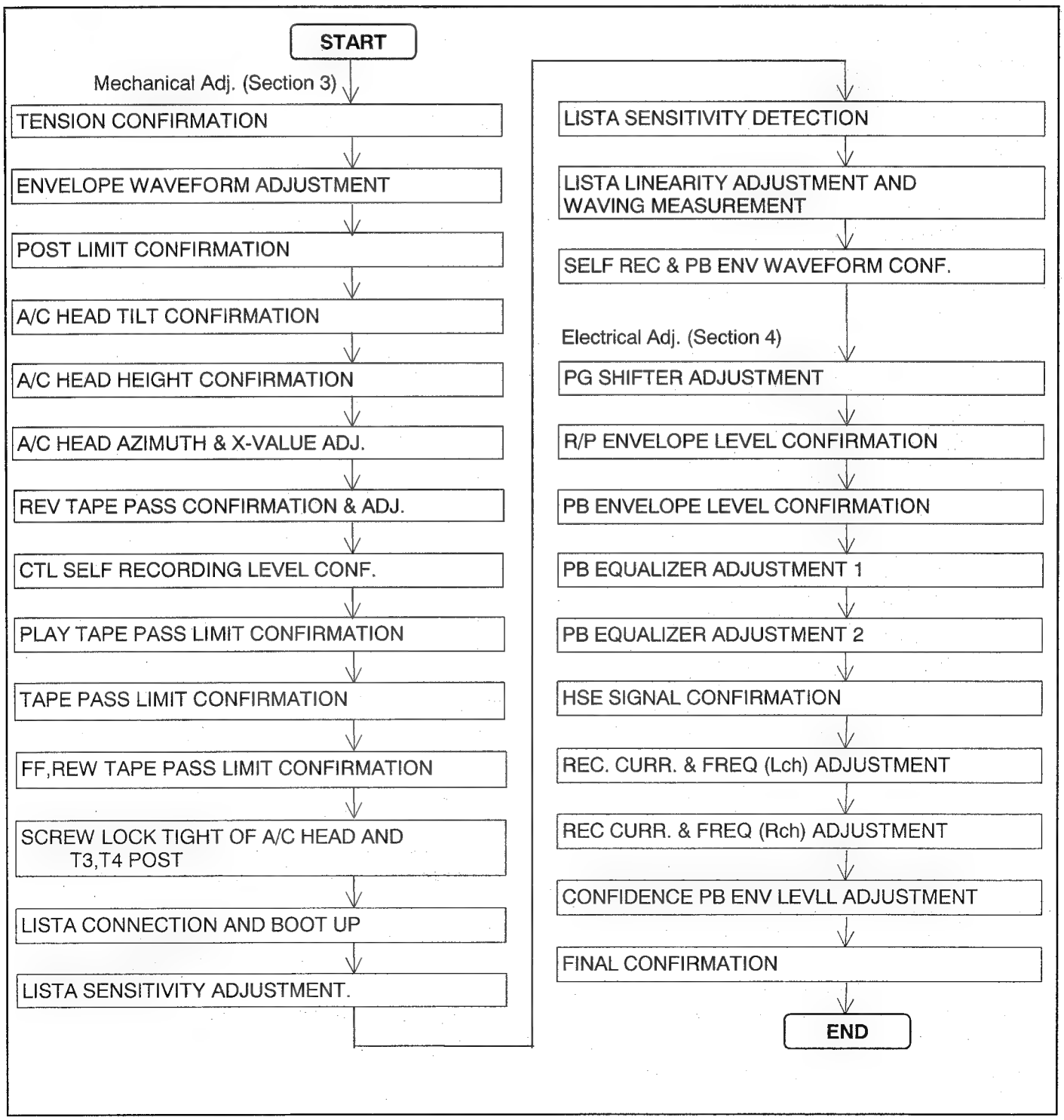
Fig. 10-1-5

10-1-1. Adjustment Flow Chart After Drum Unit Replacement

1. After changing the Drum Unit, perform the following steps.

Adjustment Flowchart After Drum Unit & Mech. Chassis Replacement

Note: Confirm the tape path linearity before head replacement.
The number indicated on the chart below is item number on the Service Manual.



10-2. A/C Head Replacement

10-2-1. Replacement

※ Required tools:
Nut Driver (5.5m/m)(VFK1150)
Hex Driver (VFK1148)
Hex Wrench (VFK1190)

(Removal)

1. Remove the Cassette Cover and Left Side Panel..
2. Remove the Cassette Up Unit.
3. Loosen the **hex. screw (B)** and remove the **Nut (C)**. Pick up the Head Height Adjustment Spring and then remove the A/C Head Unit as shown in Figure 10-2-3.

Point: Memorize the height of Nut (C) before removing the **Nut (C)**,

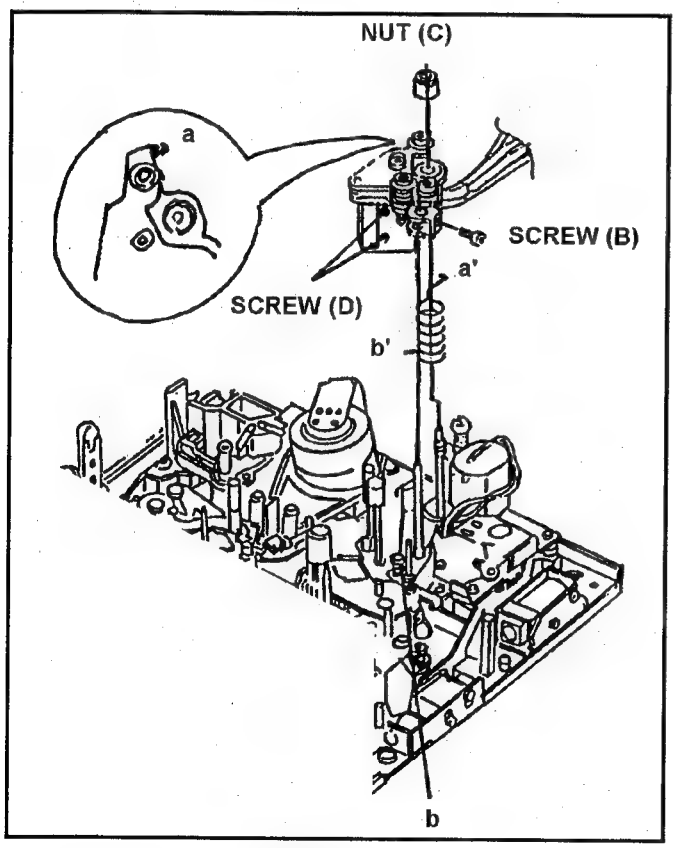


Fig. 10-2-3 Removal of A/C Head Unit

4. Remove the **2 screws (A).** Disconnect the **connector P1003** on the **Rear Jack** P.C.Board and **P600** on the **Servo** P.C.Board, and then remove the A/C Head from the A/C Head Plate.

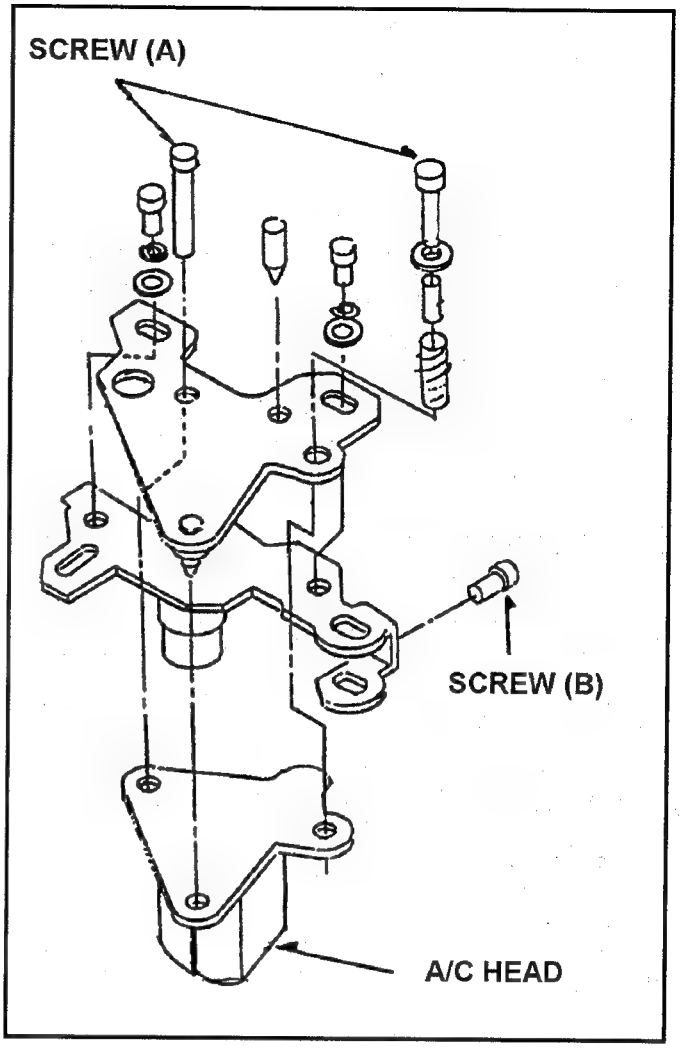


Fig. 10-2-1 Removal of A/C Head

5. Remove **2 screws (D)** to remove the Shield Cover as shown in Figure 10-2-3.
6. Unsolder the lead wires one by one. (Don't unsolder all wires at the same time.)

(Installation)

1. Remove the Shield Case from the New A/C Head and solder the lead wires to New A/C Head (Refer to Figure 10-2-2).
2. Re-install the shield case to A/C Head.
3. Install the A/C Head to A/C Head Plate and tighten **2 screws (A)** so that A/C Head is parallel to A/C Head Plate.
4. Install the A/C Head Unit.
5. Put on the Head Height Adjustment Spring and tighten **the Nut (C)**.
6. Clean the surface of the A/C Head.
7. Perform the A/C Head adjustment.

Note: After installing, Mechanical and Electrical Adjustments should be performed.
The **hex screw (B)** is kept loose until the A/C Head Height Adjustment is completed.

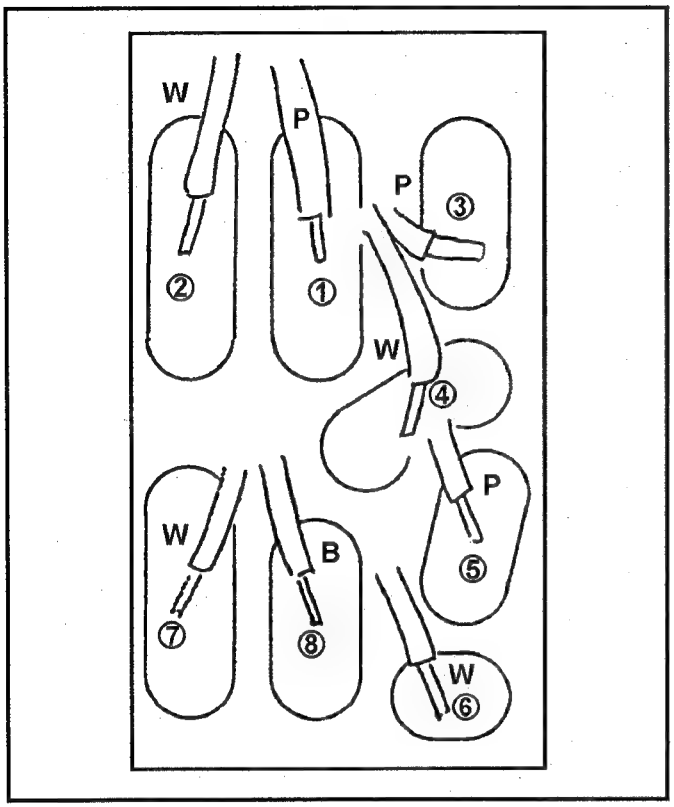
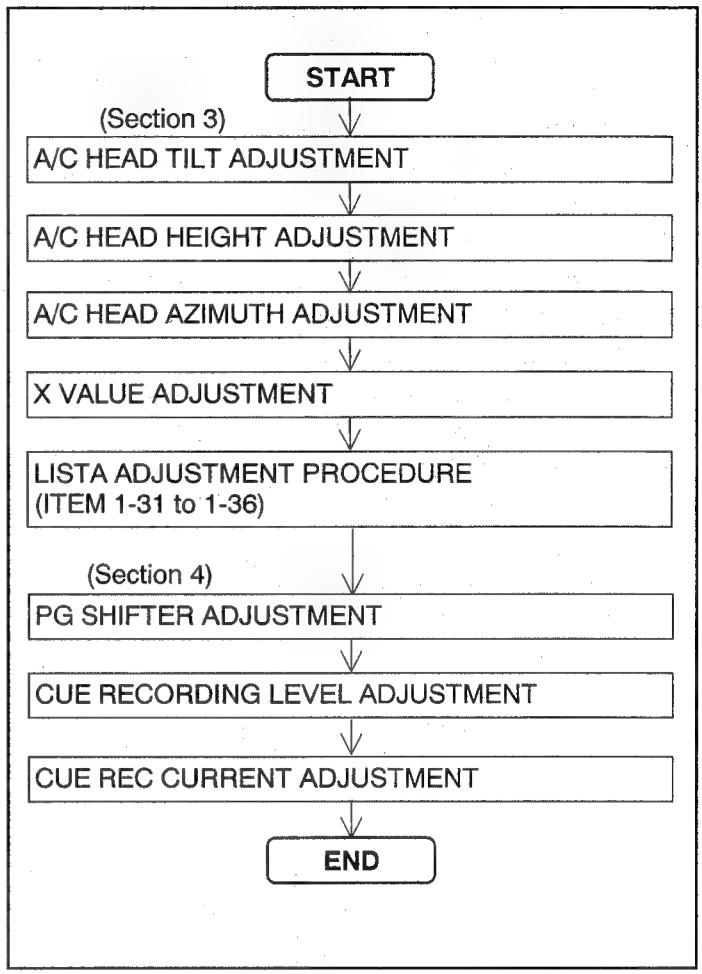


Fig. 10-2-2 Connection of A/C Head

A/C Head Side	Cable Color		Connector No.
1	PINK	YELLOW	P1003
2	WHITE		
3	PINK	RED	
4	WHITE		
5	PINK	GREEN	
6	WHITE		
7	WHITE	YELLOW	P600
8	BLACK		

10-2-2. Adjustment Flowchart After A/C Head Replacement

1. After replacing the A/C Head, perform the following steps.



10-3. Supply Reel Rotor Unit and Take Up Reel Rotor Unit Replacement

<<Supply Reel Rotor Unit>>

(Removal)

1. Remove Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Remove the connector P614 on the Servo P.C.board.
4. Remove the S5 Post (Refer to item 10-14).
5. Pull up the Arm Return Spring on the Connection Arm Angle Side.
6. Remove the Connection Arm Angle.
7. Remove the **Cut Washer (A)** and **(B)** to remove the Idler Arm Unit as shown in Figure 10-3-2.
8. Unscrew the **4 screws (C)** to remove the Supply Reel Rotor Unit as shown in Figure 10-3-2.
9. Unscrew the **2 screws (D)** to remove the S-Side M Stopper from Supply Reel Rotor Unit as shown in Figure 10-3-3.

CAUTION: Don't touch FG portion with the magnetized screw driver , when unscrewing the **screw (D)**.

(Installation)

1. Install the new Supply Reel Rotor Unit according to the opposite procedures to removing.
2. Confirm the Main Brake Torque (Refer to item 1-3 of Section 3).
3. Adjust the Reel Torque Offset (Refer to item 6-1 of Section 4).
4. Confirm the tape tension on playback mode. (Refer to item 1-11 of Section 3).

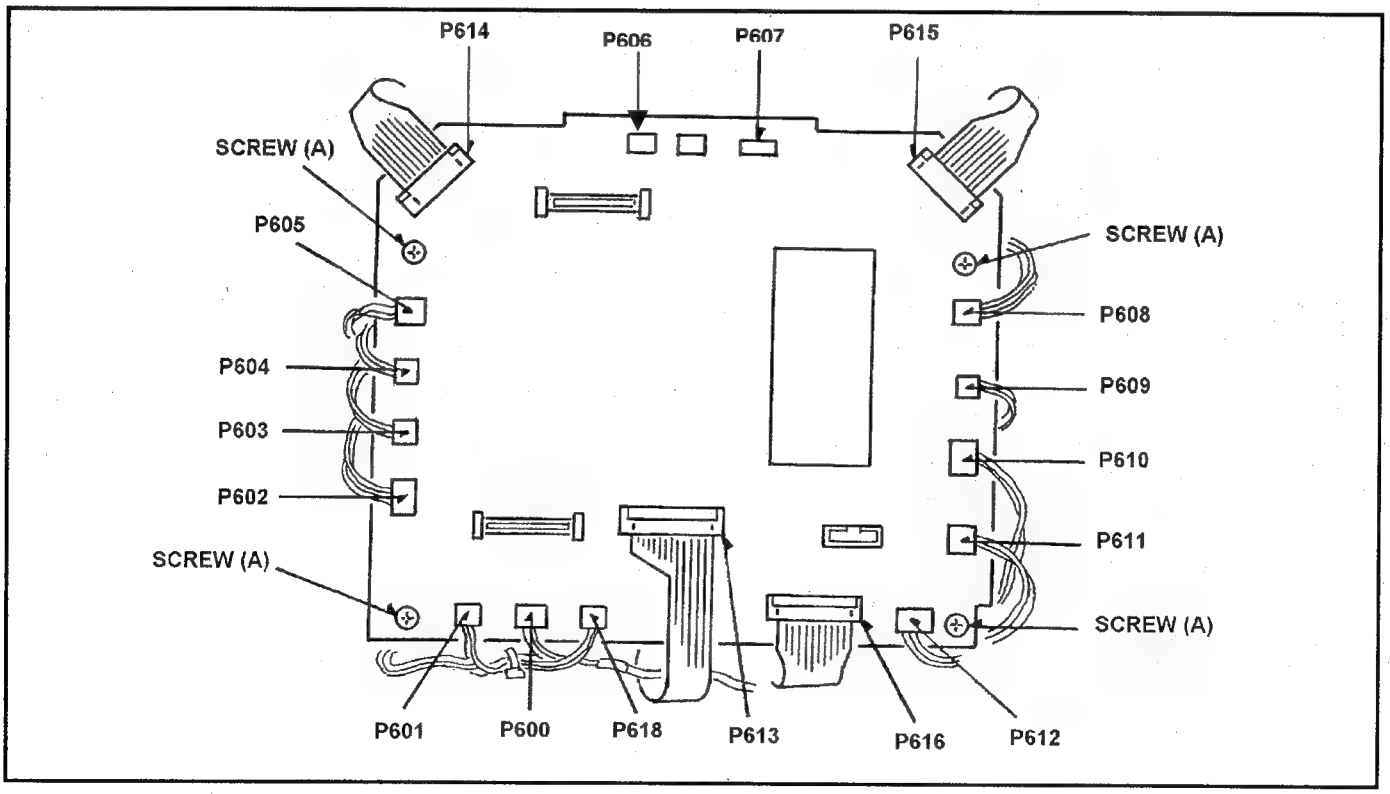


Fig. 10-3-1 Connection of Servo P.C.Board

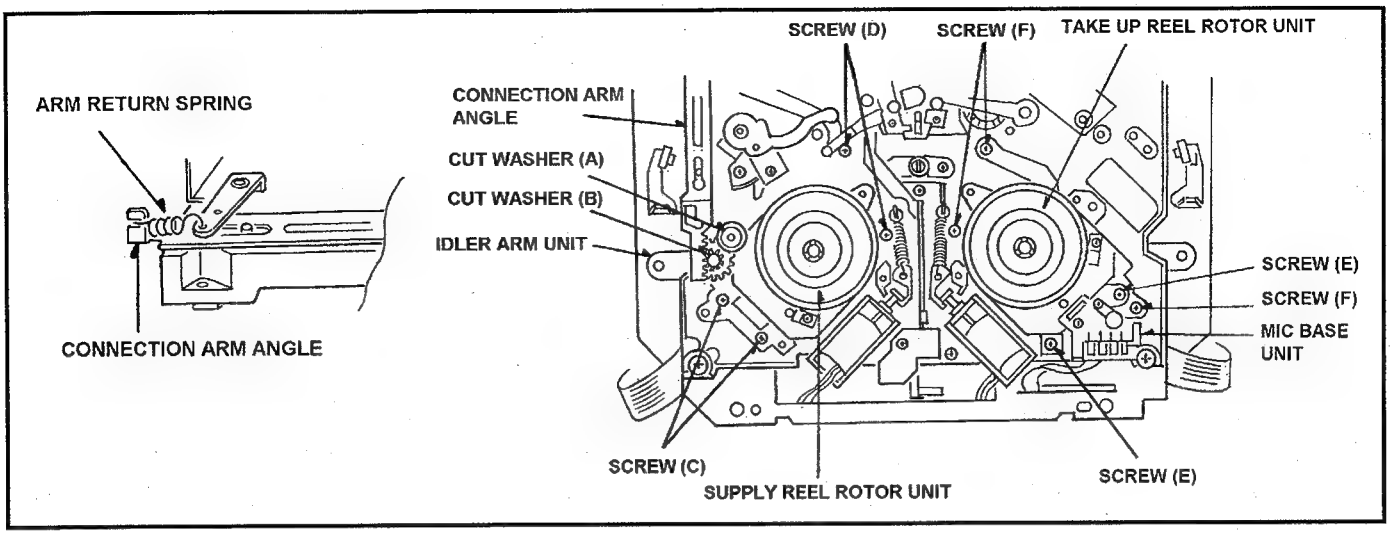


Fig. 10-3-2 Removal of Supply & Take Reel Rotor Unit

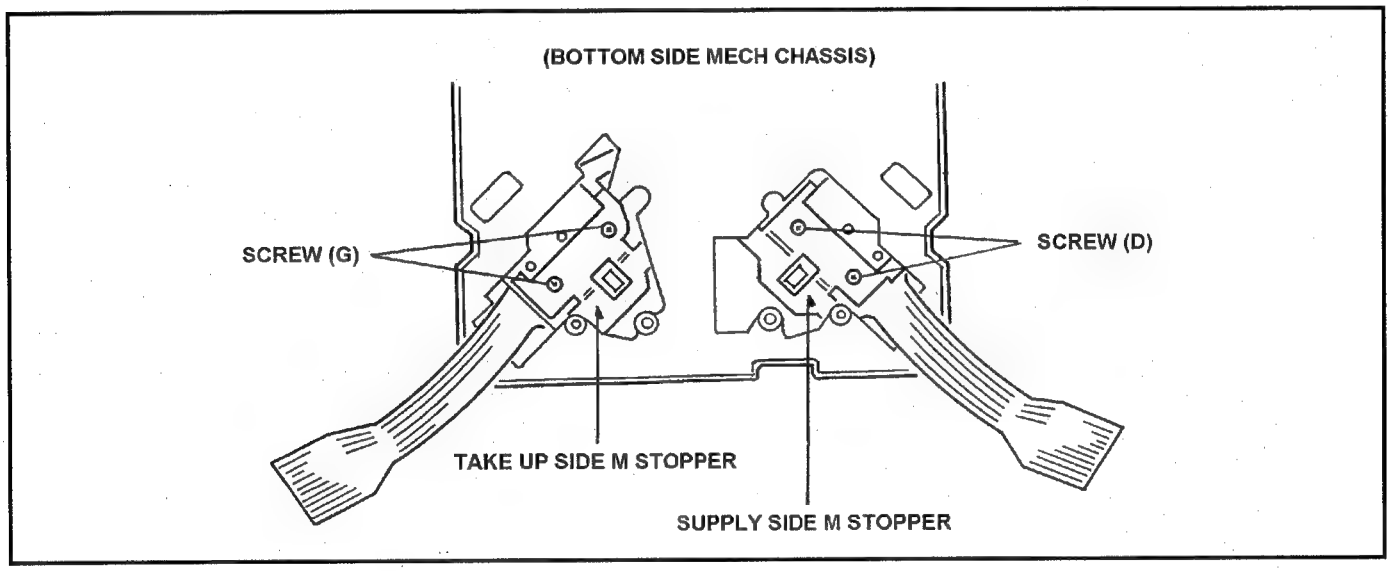


Fig. 10-3-3 Removal of Supply & Take Reel Rotor Unit

<<Take Up Reel Rotor Unit>>

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Remove the Mechanical Chassis Unit (Refer to item 11-4).
4. Disconnect the **connector P615** on the **Servo** P.C.Board and unscrews **the 2 screws (E)** ,and then remove the MIC Base Unit.
5. Unscrew the **3 screws (F)** to remove the Take Up Reel Rotor Unit as shown in Figure 10-3-2.

CAUTION: Don't touch FG portion with the magnetized screw driver when unscrewing the **screw (D).**

6. Unscrew the **2 screws (G)** to remove the T-Side M Stopper from Take Up Reel Rotor Unit as shown in Figure 10-3-3.

(Installation)

1. Install the new Take Up Reel Rotor Unit according to the opposite procedures to removing.
2. Confirm the Main Brake Torque (Refer to item 1-3 of Section 3).
3. Adjust the Reel Torque Offset (Refer to item 6-1 of Section 4).
4. Confirm the tape tension on playback mode (Refer to item 1-11 of Section 3).

10-4. Loading Motor Unit Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel..
2. Remove the Cassette Up Unit.
3. Disconnect the **connector P612** on **Servo** P.C.Board as shown in Figure 10-3-1.
4. Remove the Pinch Solenoid Unit (Refer to item 10-9).
5. Remove the Pinch Solenoid Lever. (Refer to item 10-5).
6. Unscrew **the screw (B)** to remove the Emergency Shaft as shown in Figure 10-4-1.
7. Unscrew the **2 screws (C)** to remove the Loading Motor Neutral Unit as shown in Figure 10-4-1.
8. Unscrew the **2 screws (D)** to remove the Loading Motor Unit as shown in Figure 10-4-1.

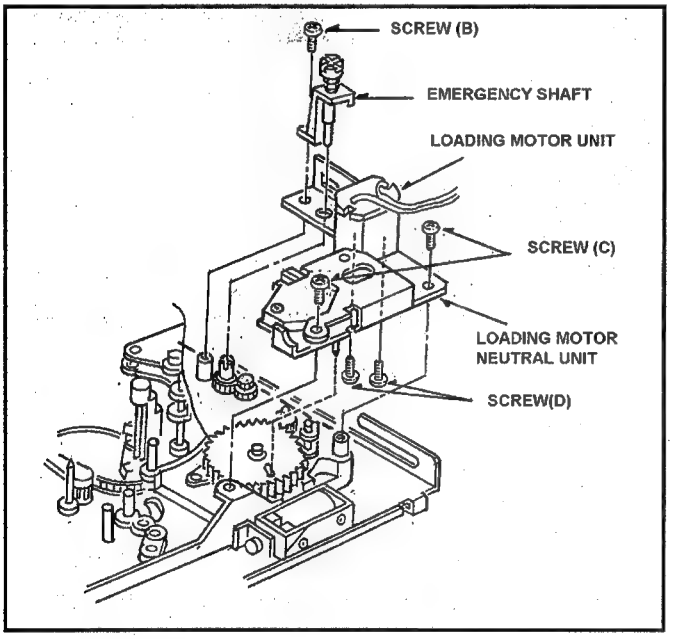


Fig. 10-4-1 Removal of Loading Motor Unit

(Installation)

1. Install the new Loading Motor Unit to Loading Motor Neutral Unit and tighten **2 screws (D)**.
2. Install the Loading Motor Neutral Unit and tighten the **2 screws (C)** so that the pin of Mode SW Unit matches groove position of main Cam Gear.
3. Install the Emergency Shaft and tighten **the screw (B)**.
4. Install the Pinch Solenoid Unit. After installing, Pinch Solenoid Position adjustment is required. (Refer to item 1-2 of Section 3).

10-5. Pinch Arm Unit Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Disconnect the **connector P610** on the **Servo** P.C.Board as shown in Figure 10-3-1.
4. Remove the Pinch Solenoid Unit (Refer to item 10-9, and pull up the Pinch Solenoid Lever as shown in Figure 10-5-1.
5. Remove the **cut washer (A)** to remove the Pinch Solenoid Lever as shown in Figure 10-5-1.
6. Remove the **cut washer (B)** to remove the Pinch Arm Unit as shown in Figure 10-5-1.

(Installation)

1. Install the new Pinch Arm Unit according to the opposite procedures to removing. Pinch Solenoid Position Adjustment is required. (Refer to item 1-2 of Section 3.)

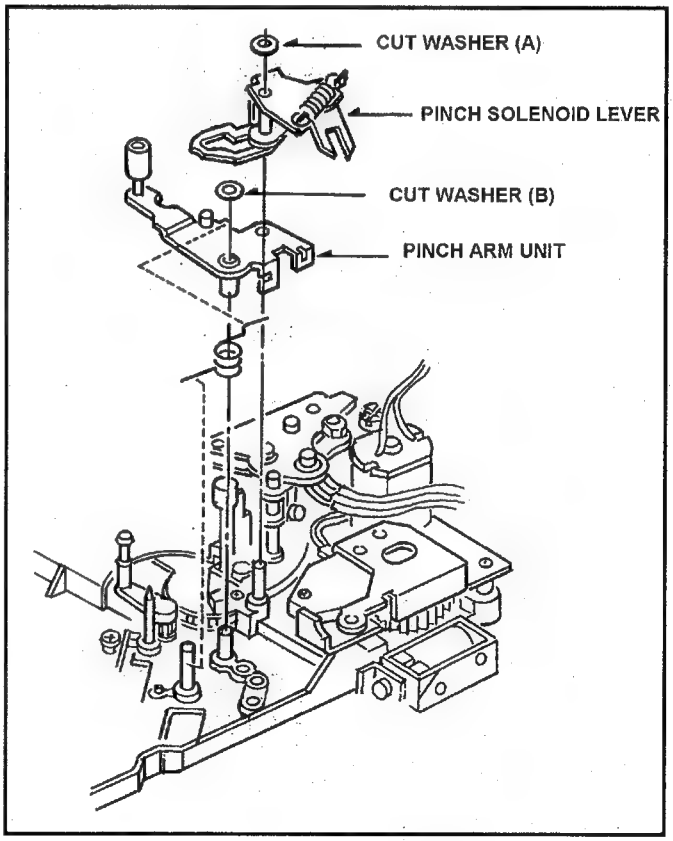


Fig. 10-5-1 Removal of Pinch Arm Unit

10-6. M Cassette Brake Base Unit Replacement

(Removal)

1. Remove the Cassette Cover and Remove the Left Side Panel.
2. Remove the Cassete Up Unit.
3. Remove the Mech Chassis Unit (Refer to item 11-4).
4. Disconnect the **all connectors** on **Servo** P.C.Board. Unscrew the **4 screws (A)** to remove the Servo P.C.Board as shown in Figure 10-3-1.
5. Unscrew the **screw (A)** to remove the Cassette Down Photo Unit.
6. Unscrew the **screw (B)** to remove the M-Lock/Release Piece Unit.
7. Unscrew the **2 screws (C)** to remove the M cassette Brake Base Unit. Then pick up the pin of Eject Arm Unit.

(Installation)

1. Install the new cassette Brake Base Unit according to the opposite procedures to removing.

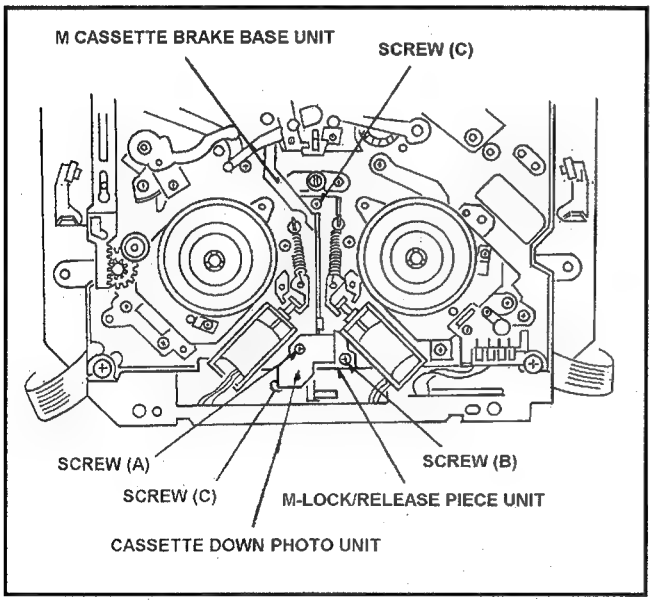


Fig. 10-6-1 Removal of M Cassette Brake Base Unit

10-7. Mode Select Switch Unit Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Disconnect the **connector P612** on the **Servo** P.C.Board as shown as Figure 10-3-1.
4. Remove the Pinch Solenoid Unit and Loading Motor Neutral Unit (Refer to item 10-4).
5. Remove the **screw (D)** to remove the Mode Select Switch Unit from Loading Motor Neutral Unit as shown in Figure 10-7-1.

(Installation)

1. Install the New Mode Select Switch Unit according to the opposite procedures to removing. (Please refer to item. [10-4. Loading Motor Unit Replacement.])

Note: Confirm that the pin of Mode Switch Unit matches groove of Main Cam Gear.

2. After installing the Pinch Solenoid Unit, Pinch Solenoid Position adjustment is required (Refer to item 1-2 of Section 3).

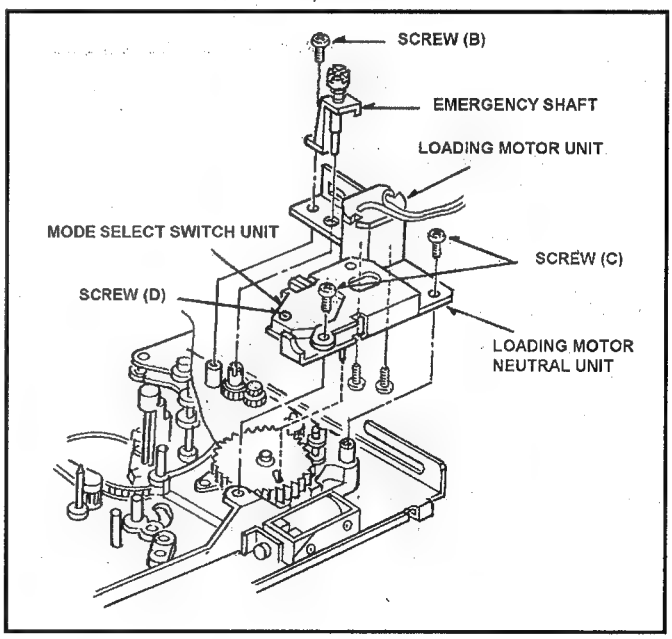


Fig. 10-7-1 Removal of Mode Select Switch Unit

10-8. Cleaning Arm Unit Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Unscrew the **2 screws (C)** to remove the BNC JACK P.C.Board as shown in Figure 10-8-3.
3. Unscrew the **2 screws (A)** to remove the T1 Guide.
4. Pick up **the tip portion (B)** of Cleaning Arm Unit and remove the spring from Cleaner Arm Unit. Then remove the Cleaning Arm Unit as shown in Figure 10-8-1.

(Installation)

1. Install the cleaning Arm Unit, then hang the spring on Cleaning Arm Unit.
2. Install the T1 Guide and tighten **2 screws (A)**.
3. Press the iron core of the Cleaner Solenoid and confirm that the Cleaner Roller is rotated when the cylinder is rotated.
4. T1 Guide position adjustment should be performed.

10-8-1. T1 Guide Position Adjustment

Place the unit in Loading completion mode.

< How to Make the No Tape Loading >

- Set a black tube to TAPE LED sensor.
- Turn on the power and then the VTR begins loading without tape. And turn power to off.

1. Observe the **clearance (B)** between T1 Guide and T1 post as shown in Figure 10-8-2. And make sure that it is within **0.2 to 0.5mm**.
2. If not, loosen the **2 screws (A)** and adjust the position of T1 Guide by moving to arrow direction (G ⇔ G) so that the **clearance (B)** is within specification. And tighten the **2 screws (A)**.

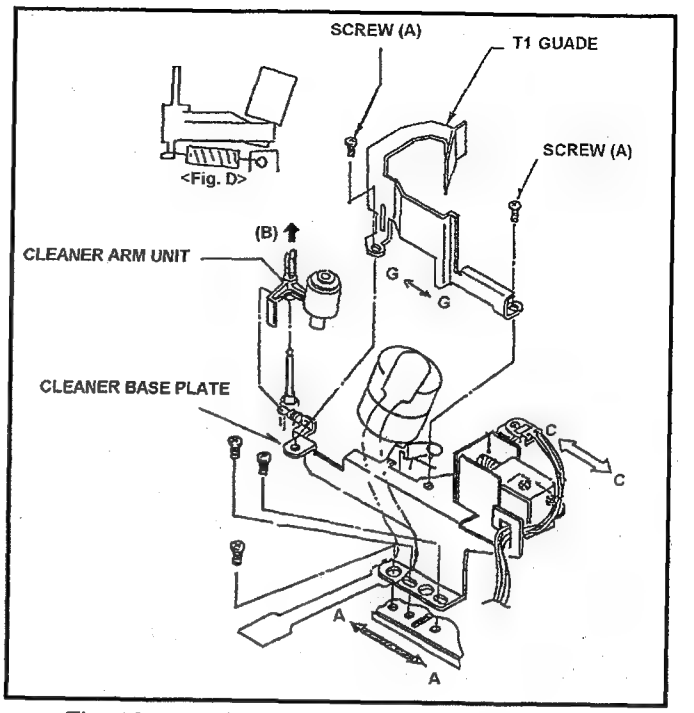


Fig. 10-8-1 Removal of Cleaner Roller Unit

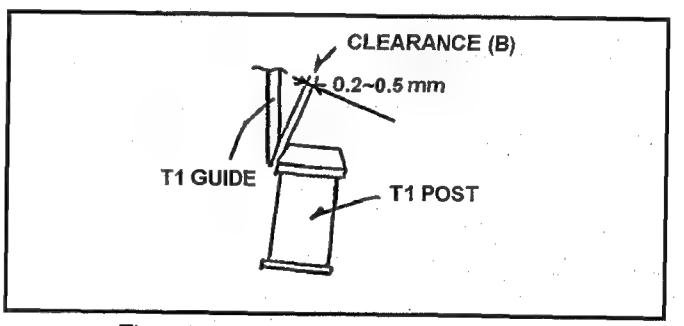


Fig. 10-8-2 Adjustment of T1 Guide

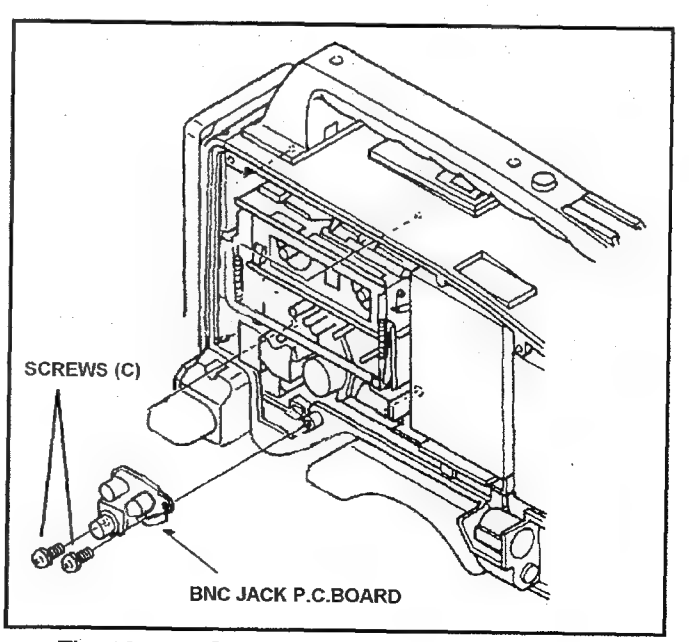


Fig. 10-8-3 Removal of BNC JACK P.C.Board

10-8-2. S & T Brake Arm Unit Replacement

(Removal)

1. Remove the Cassette Cover and Remove the Left Side Panel.
2. Remove the Cassete Up Unit.
3. Unscrew the **screw (A)** to remove the M-Lock/Release Piece Unit.
4. Unscrew **4 screws (B)** and remove the Supply and Take up Brake Solenoid from Supply and Take up Brake Solenoid Unit.
5. Lift up Supply and Take up Brake Arm Unit and hang off spring at Brake Arm Unit side.

(Installation)

2. Install the new Brake Arm Unit according to the opposite procedures to removing.

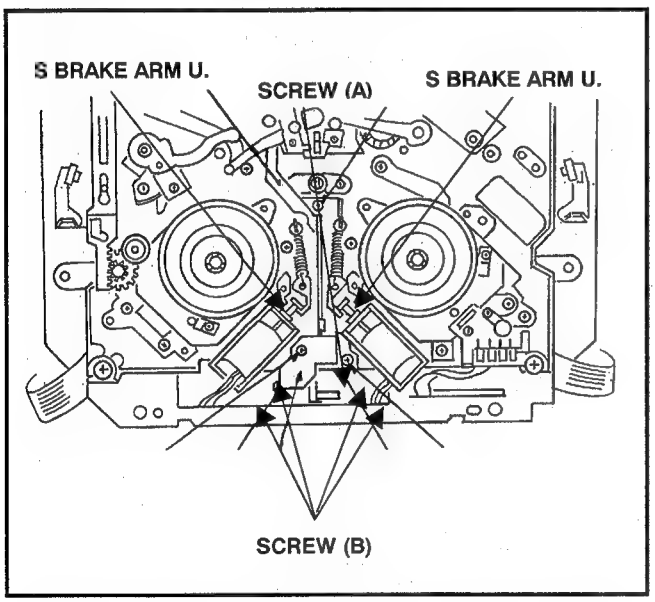


Fig. 10-6-1 Removal of M Cassette Brake Base Unit

10-9. Pinch Solenoid Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Disconnect the **connector P610** on the **Servo** P.C.Board as shown in Figure 10-3-1.
4. Unscrew the **2 screws (A)** and remove the Pinch Solenoid Unit as shown in Figure 10-9-1.
5. Unscrew the **2 screws (B)** and remove the Pinch Solenoid Angle as shown in Figure 10-9-1.
6. Unscrew the **2 screw s (C)** and remove the Pinch Solenoid from the Pinch Solenoid Base.

(Installation)

1. Install the new Pinch Solenoid according to the opposite procedures to removing.
2. After installing, Pinch Solenoid Position Adjustment is required. (Refer to item 1-2 of Section 3.)

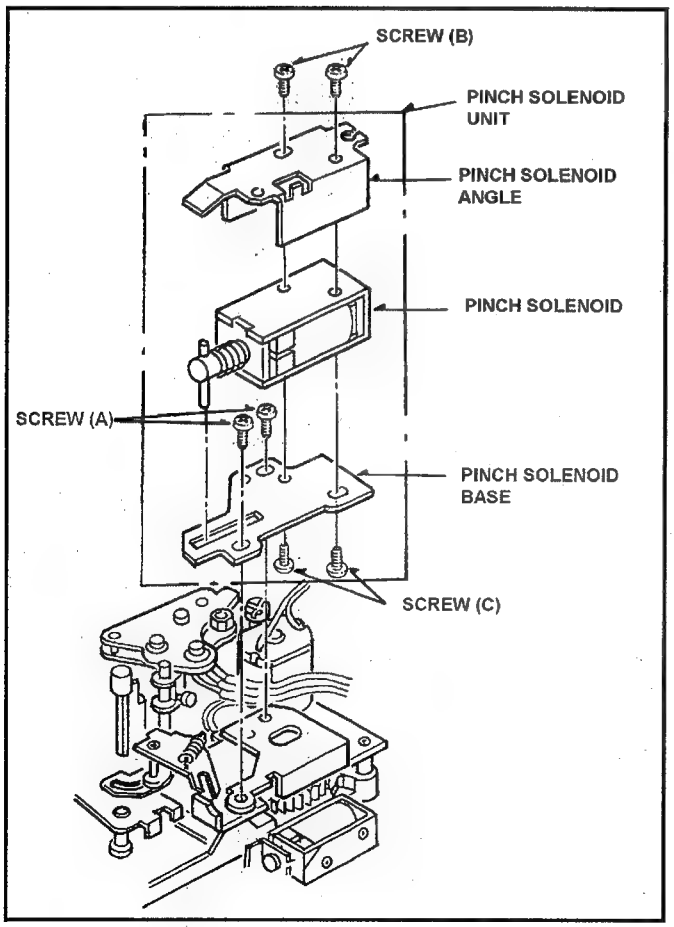


Fig. 10-9-1. Removal of Pinch Solenoid

10-10. MIC Base Unit Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Disconnect the **connector P607** on **Servo** P.C.Board.
4. Unscrew the **2 screws (A)** and remove the MIC Base Unit as shown in Figure 10-10-1.

(Installation)

1. Install the new MIC Base Unit according to the opposite procedures to removing.
2. Confirm that the M cassette touches to MIC Base Unit properly.

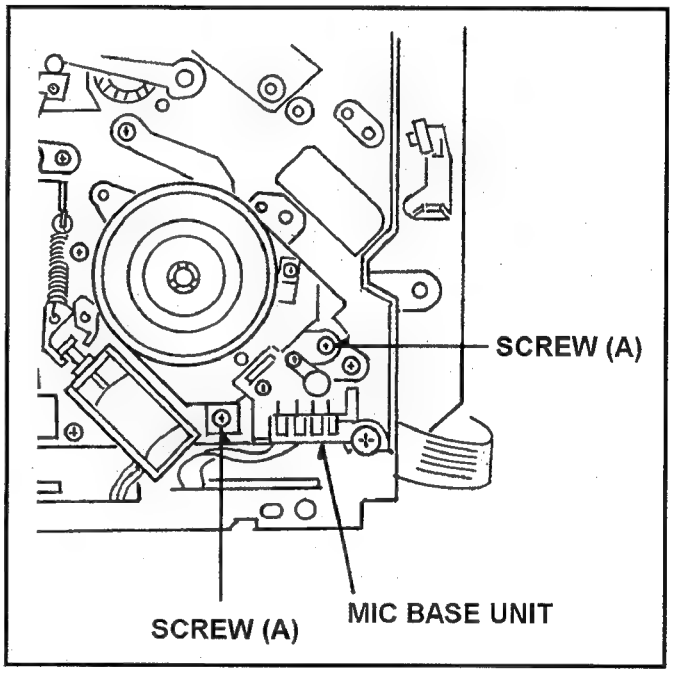


Fig. 10-10-1 Removal of MIC Base Unit

10-11. S1 Post Loading Arm Unit Replacement and Adjustment

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette up Unit.
3. Remove the S5 Post Base Unit (Refer to item 10-14).
4. Remove the Tension Arm Unit (Refer to item 10-15).
5. Unscrew the **screw (A)** and remove the S1 Post from Loading Rail as shown in Figure 10-10-1.
6. Remove the E-Ring **(A)** and remove the S1 Loading Arm Unit as shown in Figure 10-10-1.

(Installation)

1. Install the new S1 Loading Arm Unit according to the opposite procedures to removing. Then S1 Post Loading Arm Unit Phase Adjustment should be performed as shown below.
2. Adjust S1 Post Loading Arm Unit so that **the hole (A)** should match **hole (B)** as shown in Figure 10-10-1
3. After installing, confirm that the S1 Post moves smoothly on the Loading Rail.
4. Tension Arm Offset (Refer to item 1-7 of section 3), Post Height Pre-Adjustment (Refer to item 1-4 of section 3) and Linearity Adjustment (Refer to item 1-13 of section 3 [Tape Path Adjustment performed.

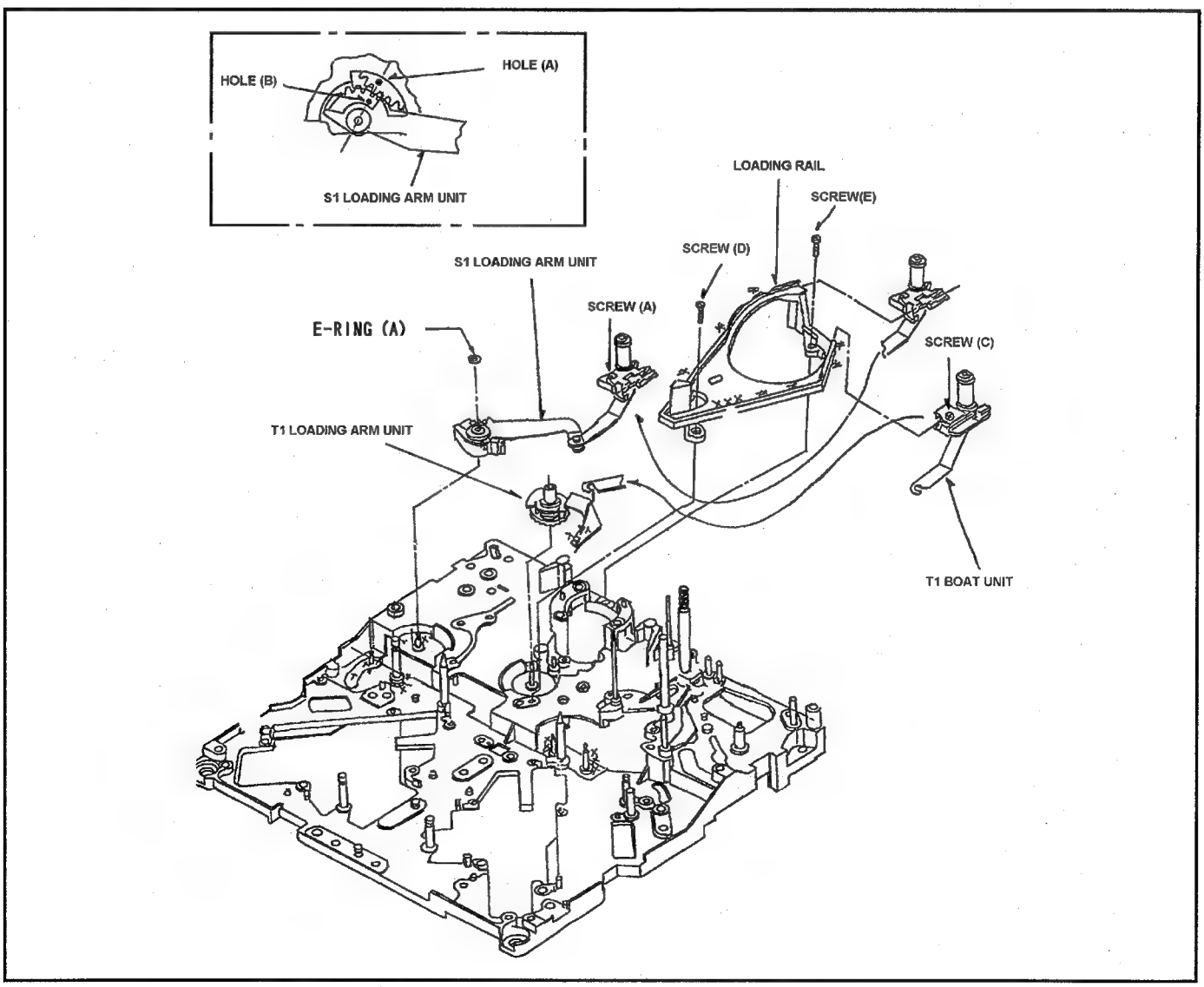


Fig. 10-10-1 Removal of S1 Post Loading Arm Unit

10-12. T1 Boat Unit Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Unscrew the **screws (C)**, and remove the T1 Post from Loading Rail as shown in Figure 10-10-1.
4. Remove the T1 Boat Unit from T1 Loading Arm Unit as shown in Figure 10-10-1.

(Installation)

1. Install the new T1 Boat Unit according to the opposite procedures to removing.
2. After installing, confirm that the T1 Post moves smoothly on the Loading Rail.
3. Linearity adjustment (Refer to item 1-13 of section 3 [Tape Path Adjustment Procedure]) should be performed.

10-10-1. T1 Loading Arm Unit Replacement and Adustment

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Remove the Cylinder Unit (Refer to item 10-1).
4. Move the T1 Post to loading direction until the **screw (D)** can be removed as shown in Figure 10-10-1.
5. Unscrew the **2 screws (A)** and **(C)**, and then remove the S1 and T1 Post from Loading Rail as shown in Figure 10-10-1.
6. Unscrew the **2 screws (D)** and **(E)**, and then remove the Loading Rail as shown in Figure 10-10-1.
7. Remove the T1 Loading Arm Unit as shown in Figure 10-10-1.

(Installation)

1. Install the T1 Loading Arm Unit according to the opposite procedures to removing. Then Phase Adjustment should be performed as follows.

Note: This unit should be replaced simultaneously with Cylinder Unit. It makes Replacement of T1 Loading Arm Unit easier.

(Adjustment)

1. When installing the T1 Boat Unit, **the hole (A)** should match **hole (B)** as shown in Figure 10-10-1.
2. After installing, confirm that the S1 and T1 Post move smoothly on the Loading Rail.
3. Post Height Pre-adjustment (Refer to item 1-4 of section 3) and Linearity Adjustment (Refer to item 1-13 of section 3 [Tape Path Adjustment Procedure]) should be performed.

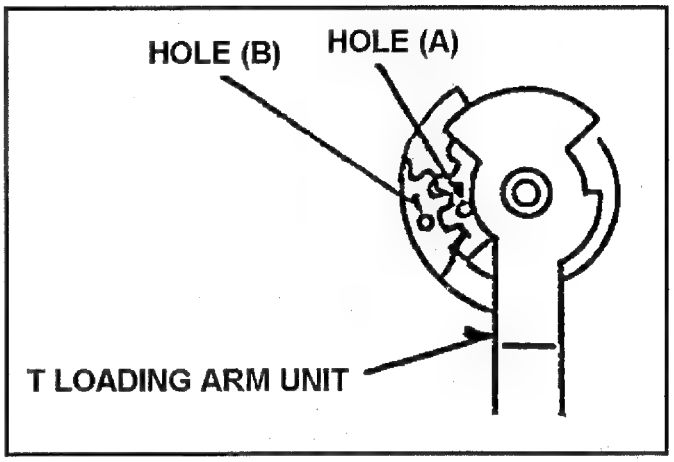


Fig. 10-10-1 Phase Adjustment of T1 Loading Arm Unit

10-13. Cleaner Solenoid Replacement and Adjustment

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Disconnect the **connector P618** on the **Servo** P.C.Board.
4. Unscrew the **2 screws (A)** and remove the Cleaner Solenoid Unit as shown in Figure 10-13-1.
5. Unscrew the **2 screws (B)** and remove the Cleaner Solenoid as shown in Figure 10-15-1.

(Installation)

1. Install the new Cleaner Solenoid according to the opposite procedures to removing.
2. After installing, Cleaner Solenoid Position adjustment should be performed as follows.

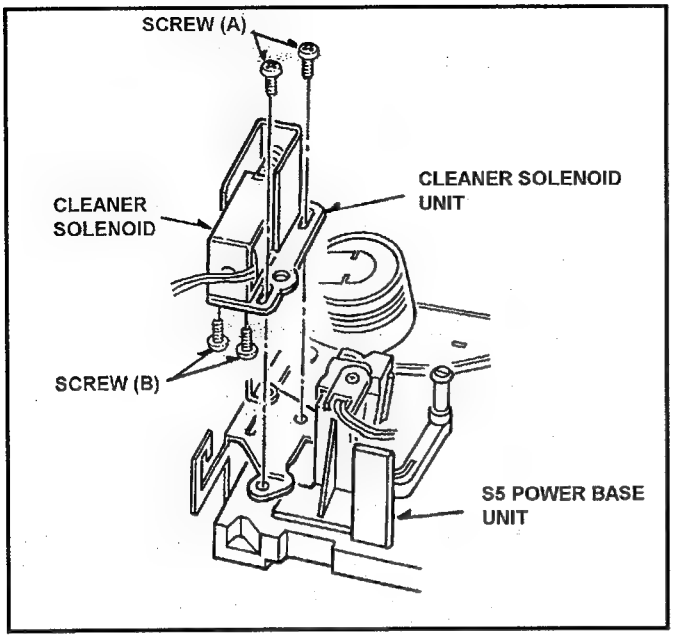


Fig. 10-13-1 Removal of Cleaner Solenoid

10-13-1. Cleaner Solenoid Position Adjustment

※ Required Tools : Eccentric Driver (VFK0357)

1. Press the iron core of Cleaner Solenoid.
2. Observe the **clearance (D)** between Cleaning Arm Unit and Cleaner Base Plate as shown in Figure 10-13-2. And make sure that it is **within 0.5 to 0.7mm.**
3. If not, loosen the **2 screws (A)** and adjust the position of Cleaner Solenoid Unit by moving to arrow direction (C⇔C) with eccentric driver so that the **clearance (D)** is within specification. And tighten the **2 screws (A)**.
4. After adjustment, confirm as follows.
5. Press the iron core of Cleaner Solenoid to release, and then return the Cleaning Roller to original position.
6. Press the iron core of the Cleaner Solenoid and confirm that the Cleaner Roller is rotated when the cylinder is rotated.

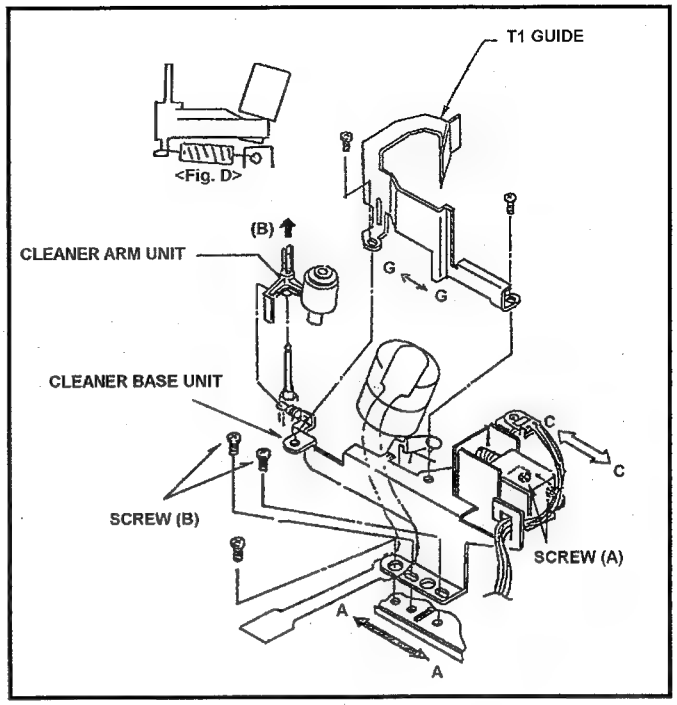


Fig. 10-13-4 Cleaner Solenoid Position Adjustment

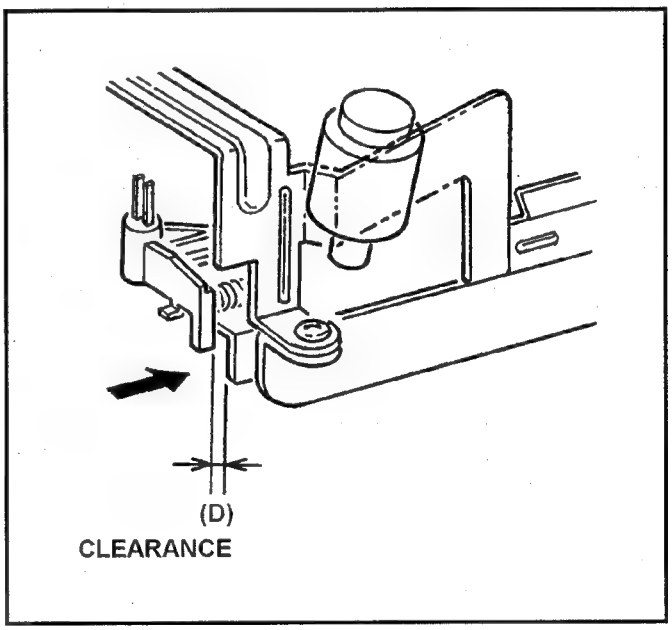


Fig. 10-13-3 Cleaner Solenoid Position Adjustment

Note: If removing the Cleaner Base Plate, Cleaner roller Position Adjustment should be performed.

10-13-2. Cleaner Roller Position Adjustment

※ Required Tools : Eccentric Driver (VFK0357)

1. Observe the **clearance (A)** between Cleaner Roller and Cylinder Unit as shown in Figure 10-13-3. And make sure that it is within **1.0 to 1.2mm**.
2. If not, loosen the **2 screws (B)** and adjust the position of Cleaner Base Plate by moving to arrow direction (A ⇔ A) with the Eccentric Driver so that the **clearance (A)** is within specification. And tighten the **2 screws (B)**.

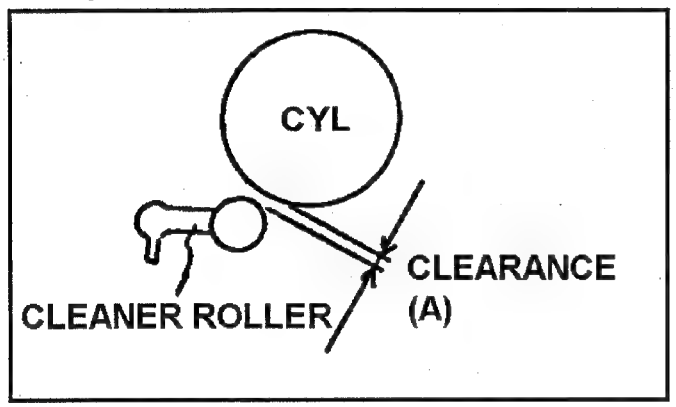


Fig. 10-13-4 Cleaner Roller Position Adjustment

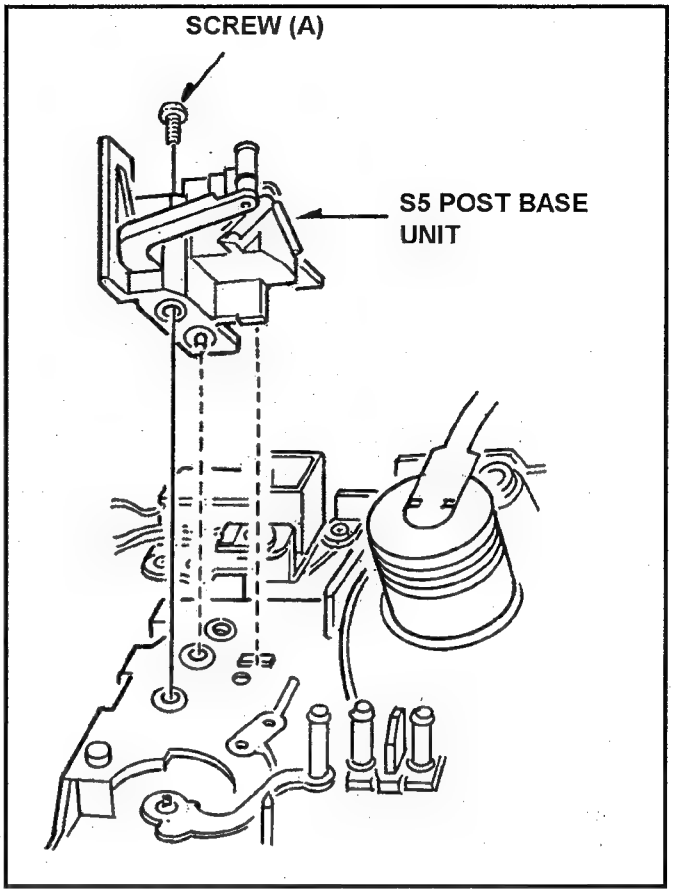


Fig. 10-14-1 Removal of S5 Post Base Unit

10-14. S5 Post Base Unit Replacement

(Removal)

1. Remove the Cassette Up Unit
2. Unscrew the **screw (A)** and remove the S5 Post Base Unit as shown in Figure 10-14-1.

(Installation)

1. Install the S5 post Base Unit according to the opposite procedures to removing.
2. After installing, Post Height Pre-adjustment (Refer to item 1-4 of section 3) and Linearity Adjustment (Refer to item 1-13 of section 3 [Tape Path Adjustment Procedure]) should be performed.

10-15. Tension Arm Unit Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Remove the **Cut Washer (A)** and pick up the Tension Regi Spring Then remove the Tension Arm Unit as shown in Figure 10-15-1.

(Installation)

1. Install the new Tension Arm Unit according to the opposite procedures to removing.
2. After installing, Tension Arm Adjustment should be performed as follows.

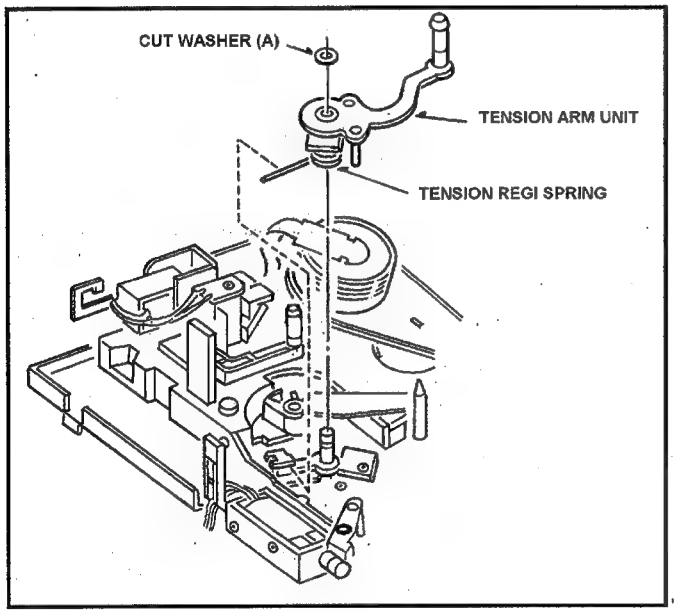
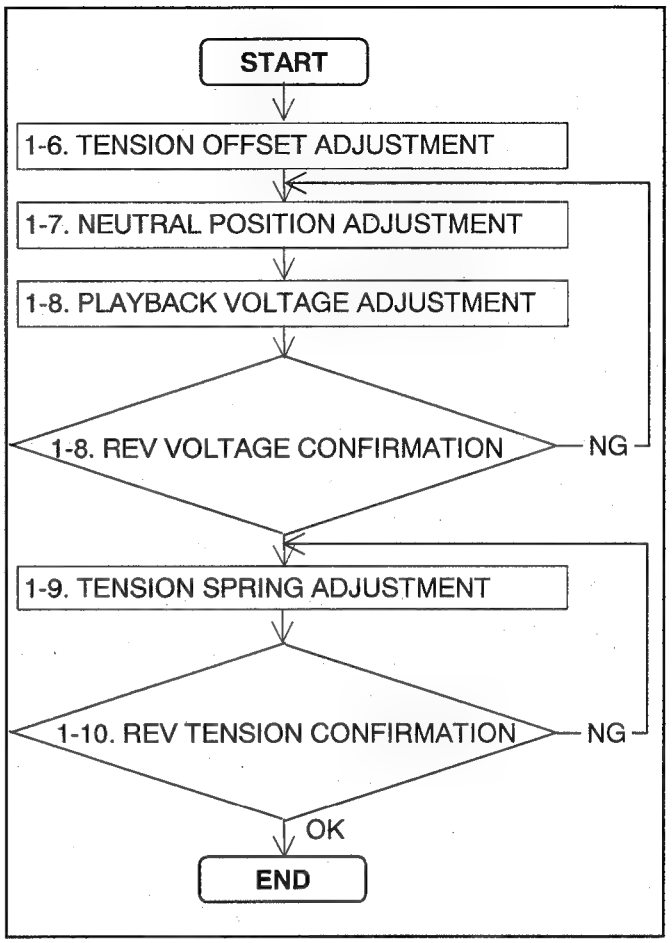


Fig. 10-15-1 Removal of Tension Arm Unit

Tension Arm Adjustment Flowchart



10-16. Main Cam Gear Replacement

(Removal)

1. Remove the Cassette Cover and Left Side Panel.
2. Remove the Cassette Up Unit.
3. Remove the Pinch Solenoid Unit (Refer to item 10-5) and Loading Motor Neutral Unit (Refer to item 10-4).
4. Remove the Main Cam Gear as shown in Figure 10-16-1.

(Installation)

1. Install the Main Cam Gear so that the pin of Main Cam Arm Unit (※) matches the groove position of Main Cam Gear as shown in Figure 10-16-1.
2. Follow the opposite procedures to removing.
3. After installing, Pinch Solenoid Position Adjustment is required (Refer to item 1-2 of section 3).

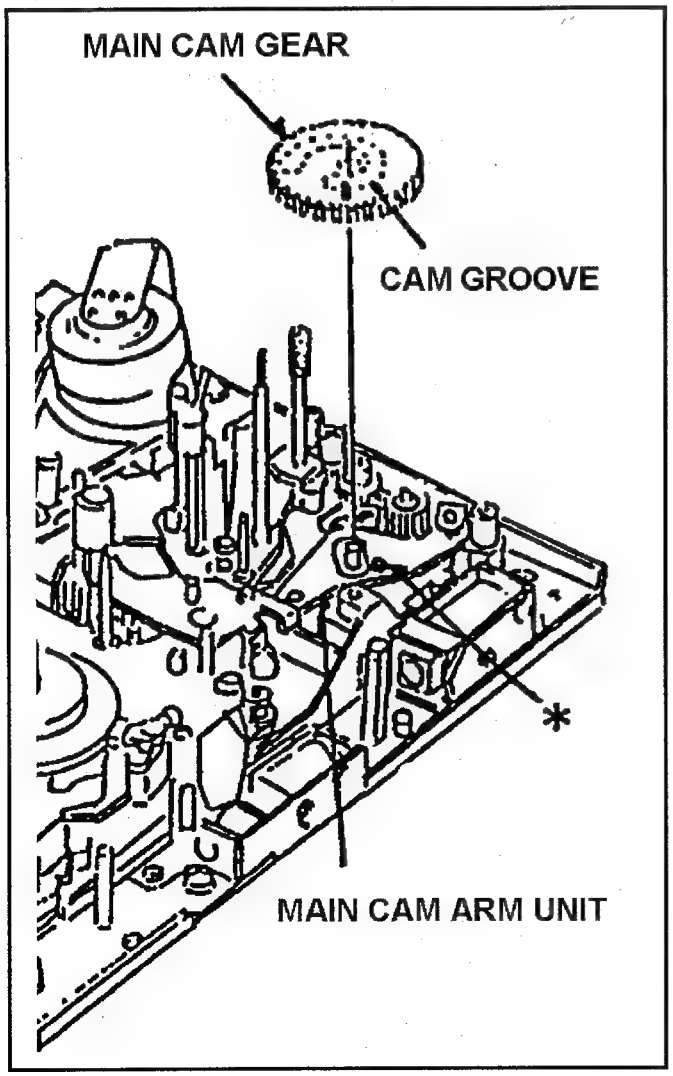


Fig. 10-16-1 Removal of Main Cam Gear

10-17. T4 Post Phase Adjustment

1. Confirm that the hole (B) of T4 Connector Gear was matched to hole of T4 Post as shown in figure 10-17-1.
2. Confirm the relation between portion (C) of T4 Connector Gear and **hole (A).as shown** in Figure 10-17-1.

Note: This confirmation should be performed on unloading condition.

1. If not, adjust the phase of T4 post follow the above procedure.

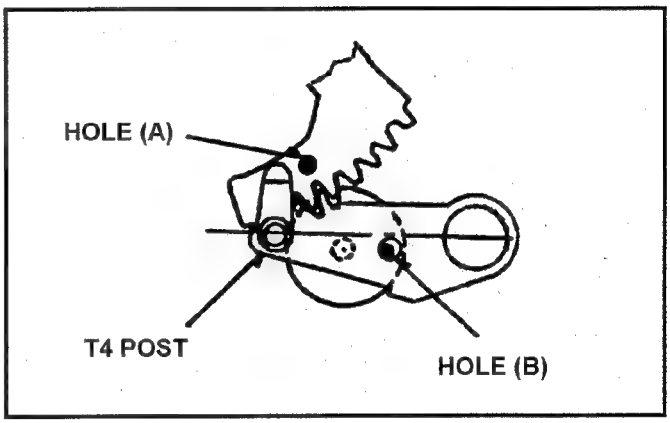


Fig. 10-17-1 Phase of T4 Post

10-18. Thrust Adjustment Screw Replacement

1. Remove the Thrust Adjustment Screw.
2. Enforce cleaning of point department of capstan shaft with an applicator.
3. Pull the oil(VFK0906) on a new Thrust Adjustment Screw, and install the upper end of the Capstan Housing.
4. Turn the Thrust Adjustment Screw slowly to clockwise until the Capstan Rotor just starts turning(separate from the Capstan Rotor).
5. Turn the Thrust Adjustment Screw another an angle of 270 degree from 180 degree (about 225 degree) clockwise as shown in figure 10-18-1.
6. Put the glue (EX: Three Bond 1401B) on the Thrust Adjustment Screw.
7. Confirm whether the Oil Seal does not come in contact with the Capstan Housing.

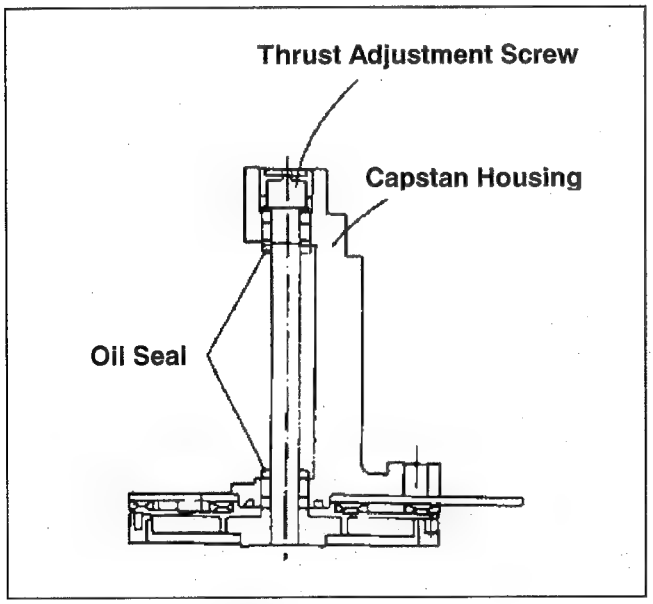


Fig. 10-18-1 Location of Oil Seal and Thrust Screw.

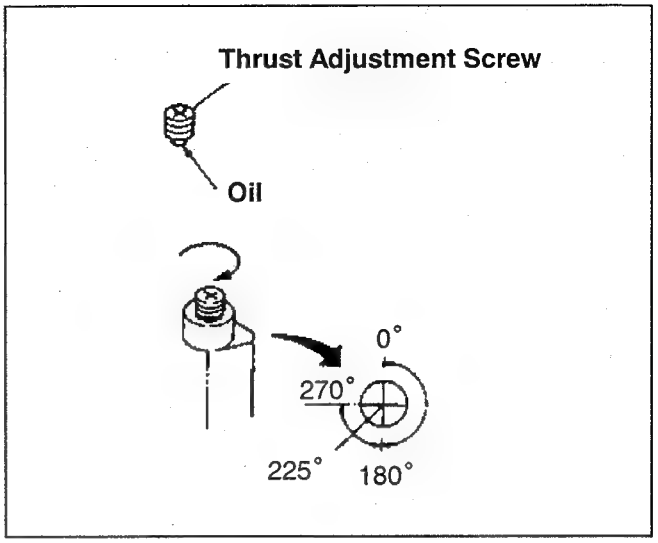
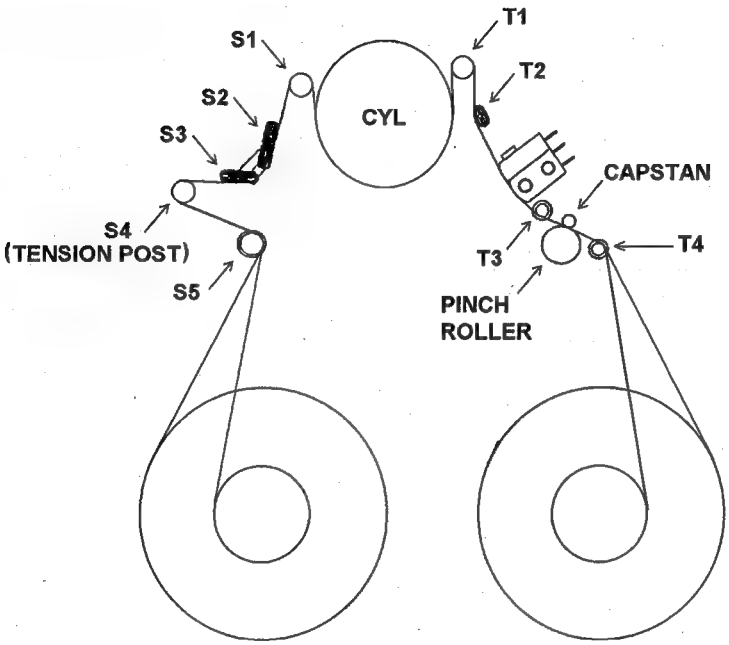


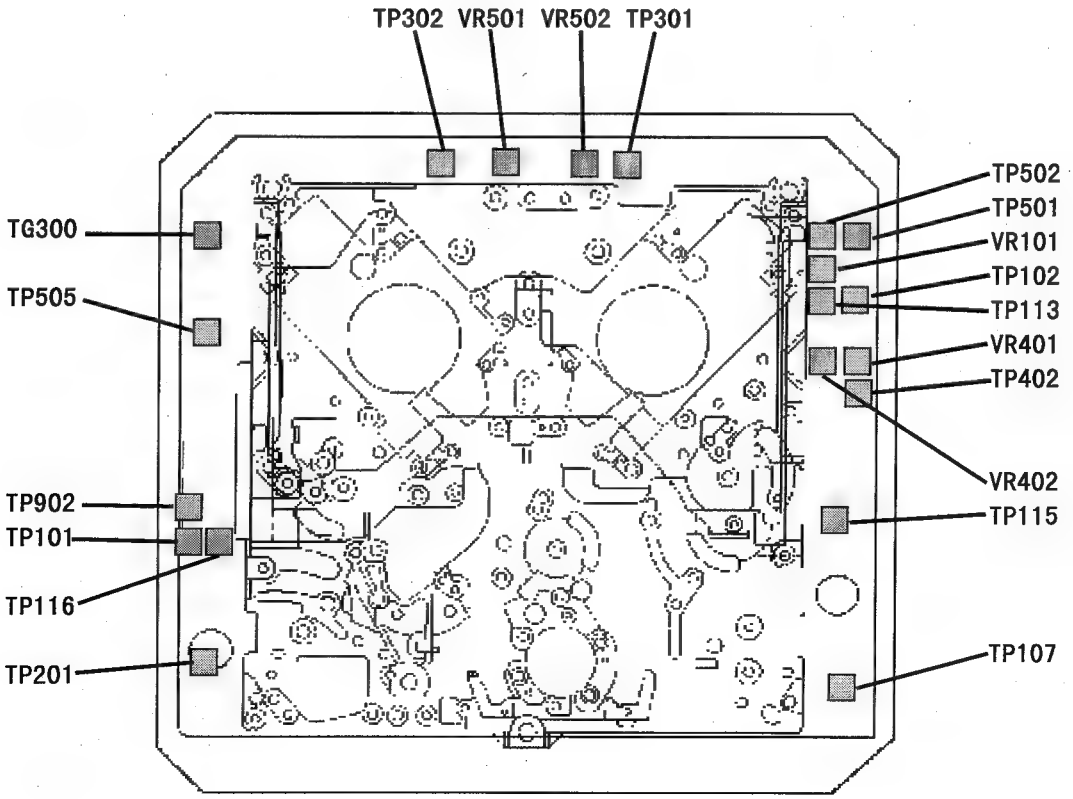
Fig. 10-18-2 Adjustment of Thrust Screw.

11. Mechanical Adjustment

1. Mechanical Adjustment Procedures

TP & VR location (Servo P.C.Board)

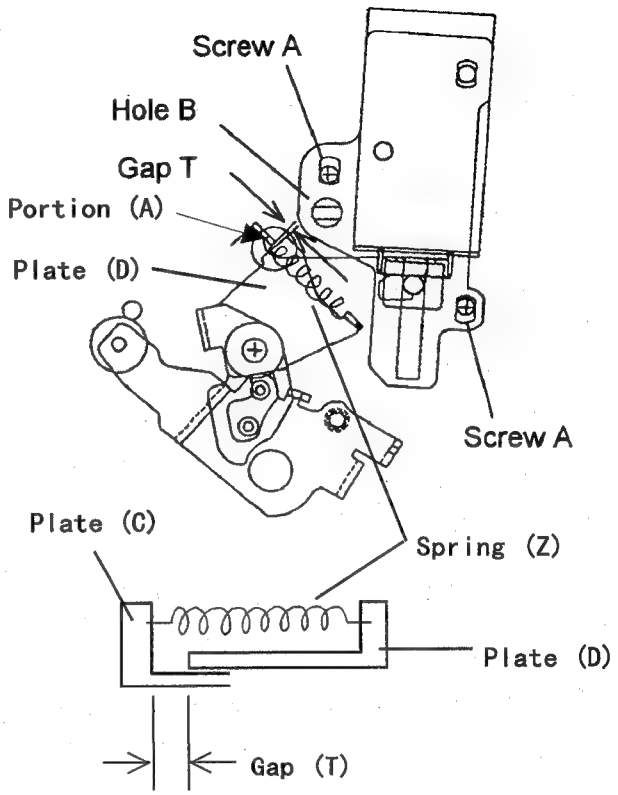


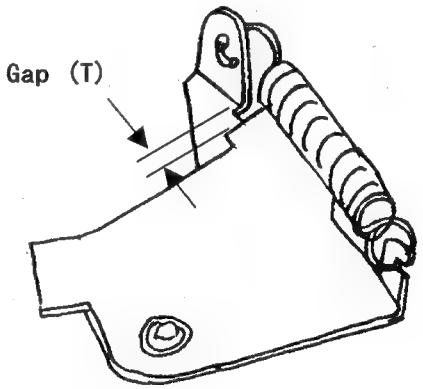


1-2. Pinch Solenoid Position Adjustment

SPEC.	T = 0.3mm
TEST POINT	Gap T
ADJUSTMEN	Screw(A), Hole(B)
MODE	EJECT (Power OFF)
TOOL	VFK0357(Eccentric Driver)

1. Confirm the power of condition at VTR.
2. Push the pinch roller by hand to be close to capstan.
3. Push the pinch solenoid by hand so that the pinch roller contacts capstan.
4. Loosen the two screws (A) and adjust the hole (B) by VFK0357 so that gap (T) is within specification.
5. The position for confirm Gap, which is located spring scratch to Plate (C) side.

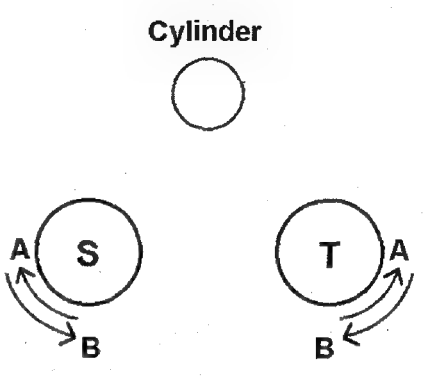




1-3. Main Brake Torque Confirmation

SPEC	Direction A : more than 80g Direction B : more than 15g
TEST POINT	S reel、T Reel
MODE	EJECT (POWER OFF)
TOOL	VFK71(150g)、VFK1191(45g)、VFK1152

1. Remove the Cassette Up Unit.
2. Install the adapter(VFK1152) to the torque gauge (VFK71).
3. Put the torque gauge on **S Reel and** Turn the torque gauge to **direction A** until **S Reel** slips against brake.
4. Confirm the torque is within specification.
5. Put the torque gauge on **T Reel** and turn the torque gauge to **direction A** until **T Reel** slips against brake.
6. Confirm the torque is within specification
7. Install the adapter(VFK1152) to the torque gauge (VFK1191).
8. Put the torque gauge on **S Reel and** turn the torque gauge to **direction B** until **S Reel** slips against brake.
9. Confirm the torque is within specification.
10. Put the torque gauge on **T Reel** and turn the torque gauge to **direction B** until **T Reel** slips against brake.
11. Confirm the torque is within specification.



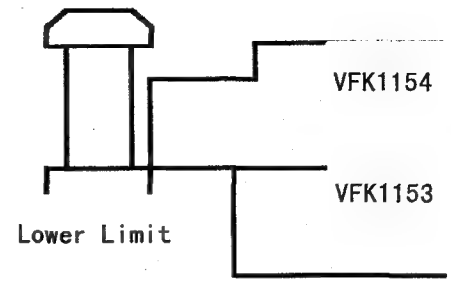
1-4. Post Height Pre-adjustment

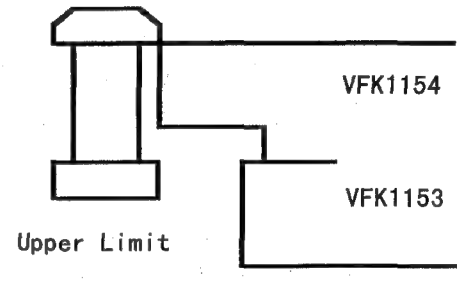
MODE	EJECT (POWER OFF)
TOOL	VFK1153, VFK1154 (Flange Tool)

1. Turn the power OFF and then set the tube* to cover the sensor LED and place the unit in no tape loading mode.
   NOTE: Make a tube* by yourself.
2. Install the Mech. Neutral Plate (VFK1153) and adjust each post height as shown in figure.
3. Adjust the each post to Lower limit by VFK1154 as shown in figure.
4. VFK1149 use for Post height adjustment of S4 and S5 post. VFK1151 use for Post height adjustment of T3 and T4 post.

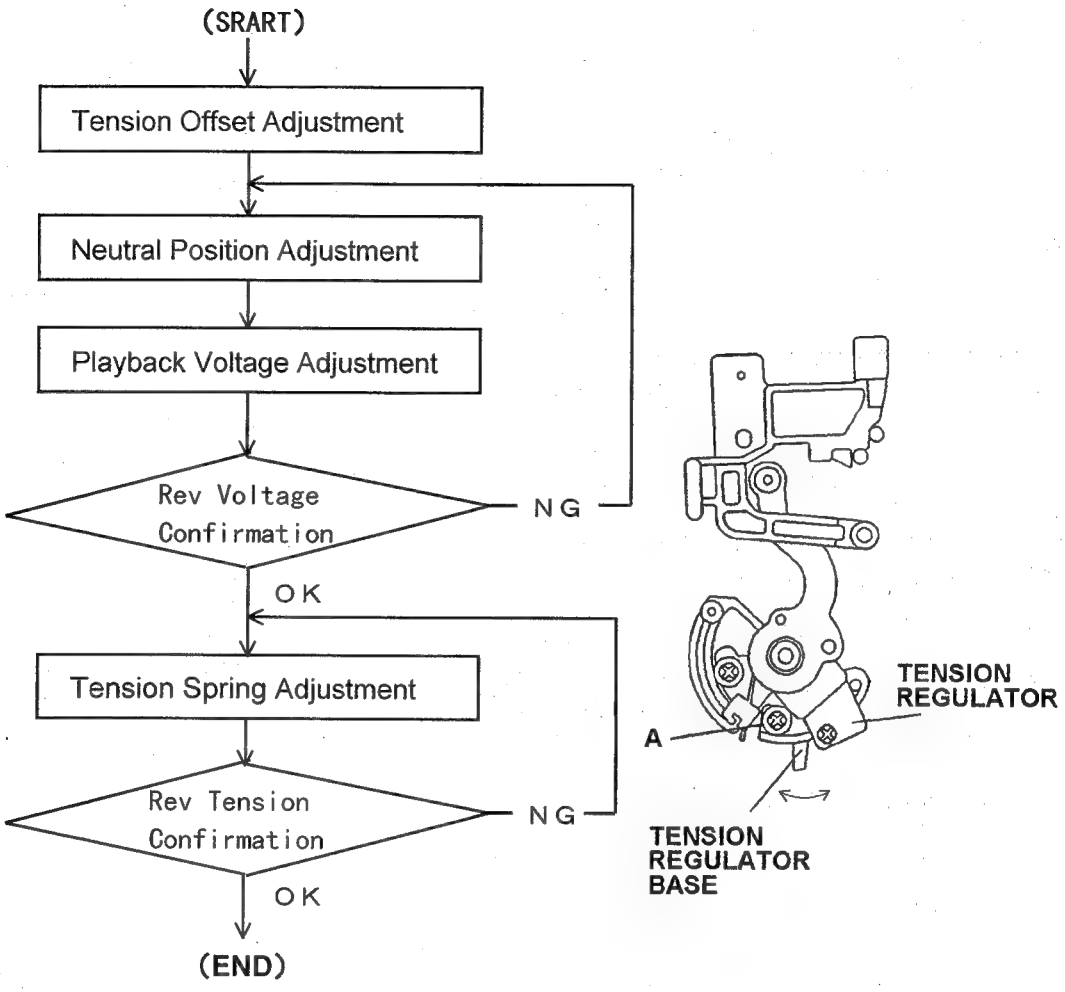
Post	Limit	Post Driver
S5 Post	Lower*	VFK1149
S4 Post	Lower*	VFK1149
T3 Post	Lower	VFK1151(2.5mm Nut Driver)
T4 Post	Lower	VFK1151(2.5mm Nut Driver)

Note: Lower* : Turn **S4** and **S5** posts 1 round more counterclockwise from lower limit position.





1-5. Tension Adjustment Flowchart



1-6. Tension Offset Adjustment

BOARD	SERVO
SPEC	2.5±0.05V
TEST POINT	TP402
ADJUSTMENT	VR402
MODE	EJECT
TOOL	Digital Volt Meter

1. Adjust the **VR402** so that the DC voltage at **TP402** is within specification.

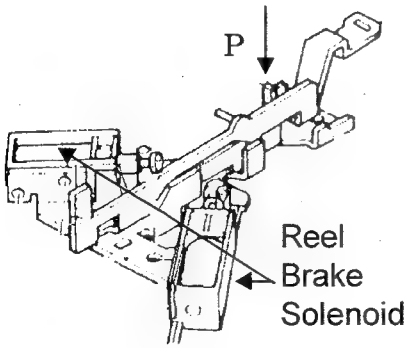
1-7. Tension Arm Neutral Position Adjustment

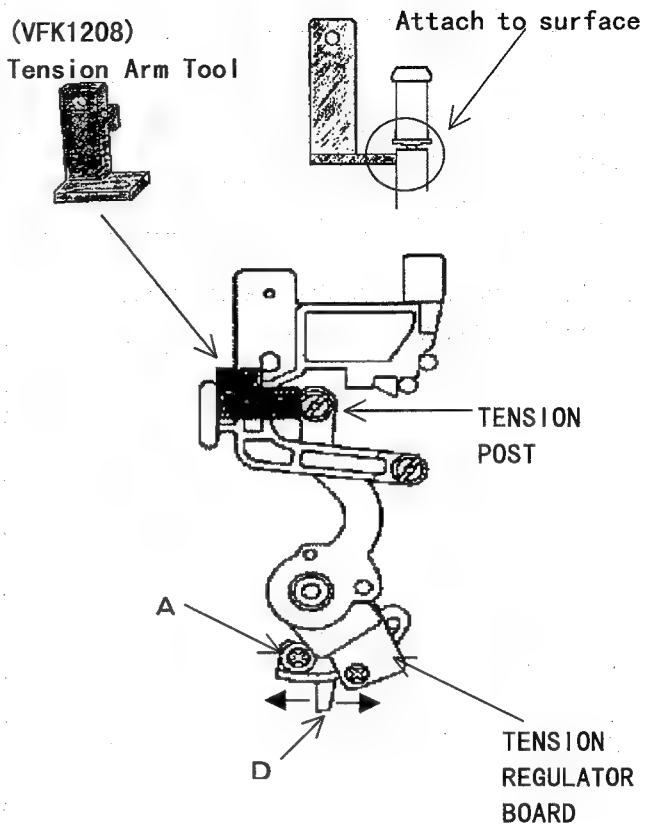
BOARD	SERVO
SPEC	2.5±0.1V
TEST POINT	TP402
ADJUSTMENT	Base position of Tension Regulator Board
MODE	STOP
TOOL	Digital Volt Meter VFK1208 (Black, with hole)

1. Remove the cassette up unit.
2. Install the VFK1208(black with hole) as shown in figure
3. Set the tube* to cover the Tape Detect (Sensor) LED and press the lever **P** to place the unit in no tape loading mode.
4. Loosen the screw (A) and move the lever (D) with tweezers for adjust the sensor position so that the DC voltage at **TP402** is within specification.

CAUTION: 1. Do not use magnetized tweezers and Screw driver.
2. Do not touch the magnetize Screw driver to S-Reel FG magnet portion, when the lever (D) portion is adjusting.

Note: Make a tube* by yourself.



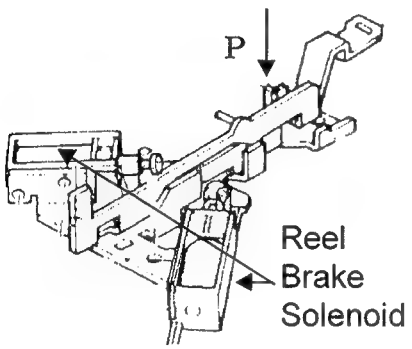


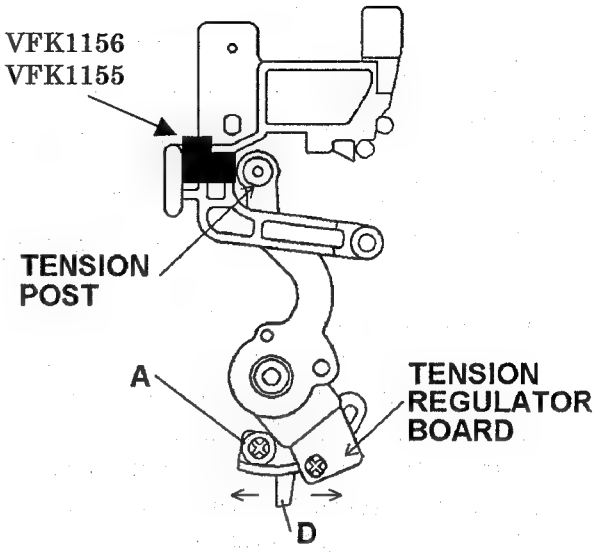
1-8. Tension Arm PLAY and REV voltage adjustment

BOARD	SERVO
SPEC	(PLAY) 3.8±0.05V (REV) 1.2±0.3V
TEST POINT	TP402
ADJUSTMENT	VR401
MODE	STOP
TOOL	Digital Volt Meter VFK1156(Black:for PLAY position) VFK1155(White:for REV position)

1. Install the VFK1156(black) as shown in figure.
2. Set the tube* to cover the Tape Detect (Sensor) LED and press the lever **P** to place the unit in no tape loading mode.
3. Adjust the VR401 so that the DC voltage at TP402 is within specification (PLAY).
4. Install the VFK1155 as shown in figure and confirm that the DC voltage at TP402 is within specification (REV).
5. If it out of spec, perform the Neutral Position adjustment again.

Note: Make a tube* by yourself.



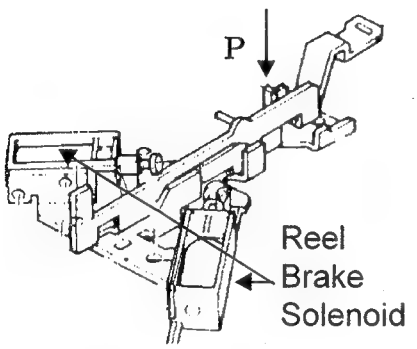


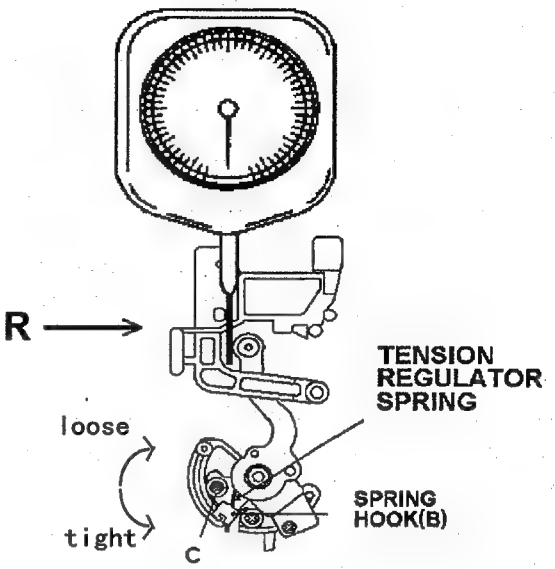
1-9. Tension Regulator Spring Adjustment

BOARD	SERVO
SPEC	11±1gf
TEST POINT	TP402
ADJUSTMENT	Tension Regulator Spring hook (B)
MODE	STOP
TOOL	Digital Volt Meter VFK1188(30g Dial Tension Gauge)

1. Remove the cassette up unit.
2. Set the tube* to cover the Tape Detect (Sensor) LED and press the lever **P** to place the unit in no tape loading mode.
3. Insert the tension gauge to push the tension post to the direction R until the voltage at the TP402 is 3.8V (PLAY position)
4. Loosen the screw (C) and adjust the position of hook (B) so that the indication of gauge is within specification..

Note: Make a tube* by yourself.

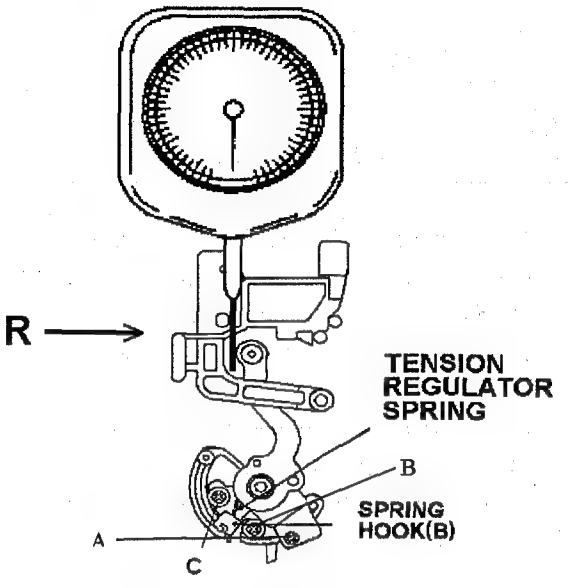




1-10. REV Tension Confirmation

BOARD	SERVO
SPEC.	18±2gf
TEST POINT	TP402
MODE	STOP
M.EQ	Digital Volt Meter VFK1188(30g Dial Tension Gauge)

1. Remove the cassette up unit.
2. Set the tube* to cover the Tape Detect (Sensor) LED and press the lever **P** to place the unit in no tape loading mode.
3. Insert the tension gauge to push the tension post to the direction R until the voltage at the TP402 is 1.2V (REV position)
4. Confirm that the indication of gauge is within specification. If not, make the Tension Spring Adjustment again.
5. After finish this adjustment , grew the screw A,B and C . The grew quantity at B is half of A and C.

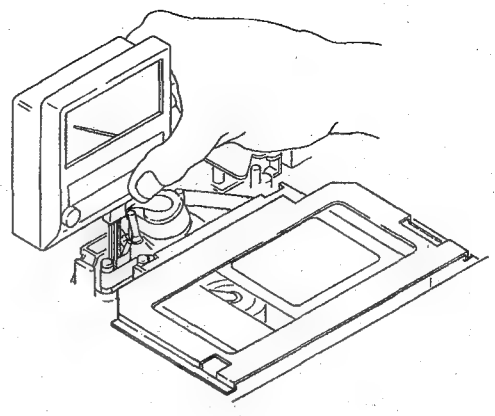


1-11. Tension Confirmation

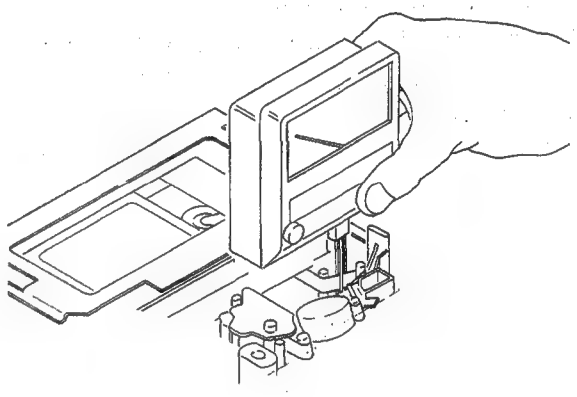
SPEC	(PLAY)6.0±1gf (REV) 9.0±2gf
MODE	PLAY、REV×1
TAPE	63 min M size Blank Tape
TOOL	VFK1145(Tension Meter)

1. Play back beginning portion of the tape.
2. Insert the tension meter between **S3 post** and **S4 post**.(Refer to figure).
3. Confirm the tension is within specification.
4. Place the unit in REV mode.
5. Insert the tension meter between **S4 post** and **S5 post**.(Refer to figure)
6. Confirm the tension is within specification.

NOTE: Be careful not to give some tape damage.

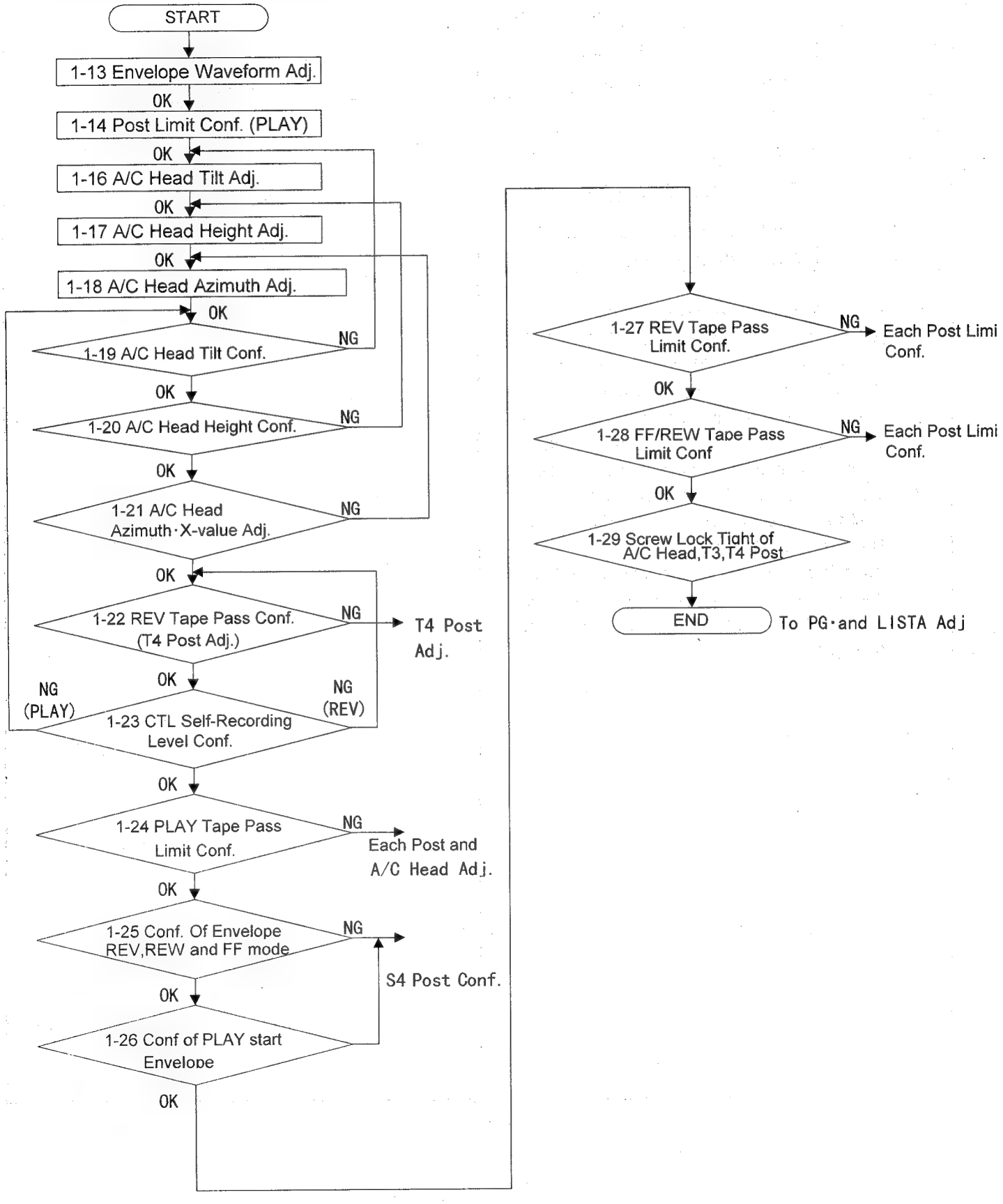


Play Tension



Rev Tension

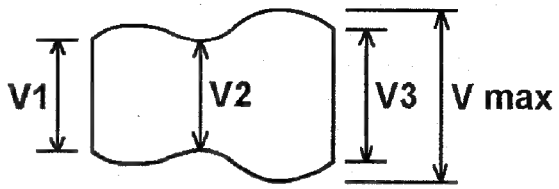
1-12. Tape Pass Adjustment Procedure



1-13. Envelope Waveform Adjustment

SPEC	V1/Vmax、V2/Vmax、V3/Vmax ≧ 0.8
TEST POINT	TP500 R/P ENV (RF Board) TP300 R/P HSW (RF Board)
ADJUSTMENT	S1、T1 Post Height
MODE	PLAY(ATF)
TAPE	VFM3580KM, VFM3680KM
M.EQ	Oscilloscope
TOOL	VFK1149(Post Driver)

1. Playback the the alignment tape.
2. Adjust S1 and T1 post height so that the R/P envelope output is within the specification.
3. When the S1 and T1 posts are adjusted, first raise the post height and make small the entrance and exit side of the envelope, then down the post until envelope becomes flat.
4. With order to adjustment, basically adjust T1 post for makes flat at exit side of envelope first and adjust S1 post.
5. After finish this adjustment, unload the tape and load the tape again, then confirm the shape of Envelope waveform does not changed.

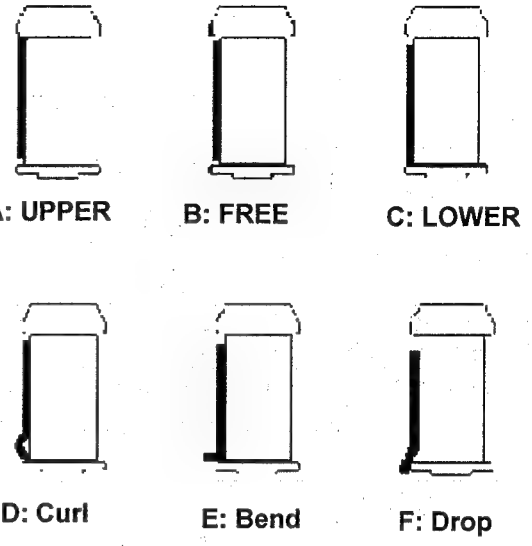


1-14 Post Limit Confirmation (PLAY)

SPEC	Post limit shown in the table No tape curl
MODE	PLAY
TAPE	Blank Tape
TOOL	VFK1149(Post Driver) VFK1151(Nut Driver)

1. Confirm that the tape pass limit follow the as shown as below table and adjust it in case of need.
2. Confirm that the kinds of D、E and F condition do not appeared on the tape as shown in figure.

Post	Limit	Adjustment
S5	Lower limit or Free	S5 Post Height
S4	Lower Limit	S4 Post Height
S1	Upper Limit	Envelope waveform
T1	Upper Limit	Envelope waveform
T3	Lower Limit	T3 Post Height
T4	Lower limit or Free	T4 Post Height

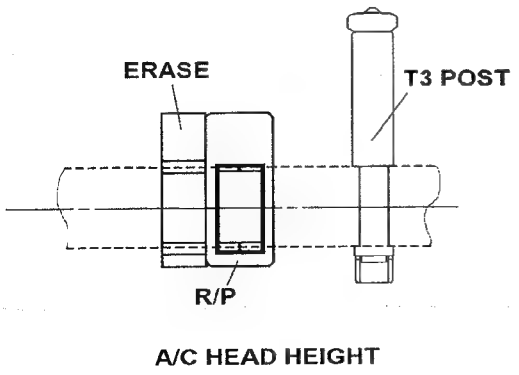


1-15. A/C Head Adjustment Method

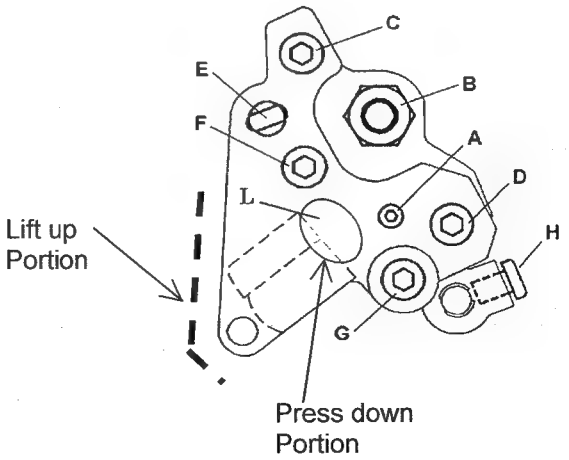
Adjustment Item	SCREW	Adjustment Method	Torque
Tilt adjustment	A	Tighten direction · · · Decrease CUE Loosen direction · · · Increase CUE	
Height adjustment	B	Tighten direction · · In case of increase CTL, when A/C Head Press down. Loosen direction · · In case of increase CTL, when A/C Head lift up.	
Azimuth adjustment	F	Phase is adjusted by screw F	
X-value adjustment	C D	Adjust X-value by VFK0357 at Hole (E), then tighten the screw (C) and (D) to fix A/C Head horizontal position.	2.5Kg.cm
Fixed Tilt and Azimuth	G	Screw (G) is always tighten during adjustment except Tilt and Azimuth.	1.0Kg.cm
Fixed height	H	After height adjustment, tighten the screw (H) to fix height of A/C Head.	

SCREW	Tool for adjustment
A	VFK1178 (0.89mm Hex Driver)
B	VFK1150 (5.5mm Tool for adjustment)
F	VFK1148 (1.5mm Hex Driver)
C,D,G	VFK1209 (Torque Driver) VFK0912 (1.5mm Post Axis Driver)
H	VFK1190 (1.5mm L type of Hex Wrench)

1. Each adjustment of A/C Head should be perform under the screw (G) tightened.
2. Confirm the screw (A) does not loosen, before execute the A/C Head Tilt adjustment. The screw (A) should be always touch to top of A/C Head.
3. Be careful the tape damage at T3 Post, when adjust tilt of A/C Head.
4. When the height of A/C Head is adjusted by Nut (B), first the screw (H) should be loosen. And after height adjustment finished, tighten the screw (H) lightly.
5. Each adjustment of A/C Head should be finished at the condition of turn the each adjustment screw tighten direction. And hit the portion (L) lightly for remove the distortion.
6. Adjust alternately each A/C Head adjustment with Envelope Waveform adjustment.



A/C HEAD HEIGHT



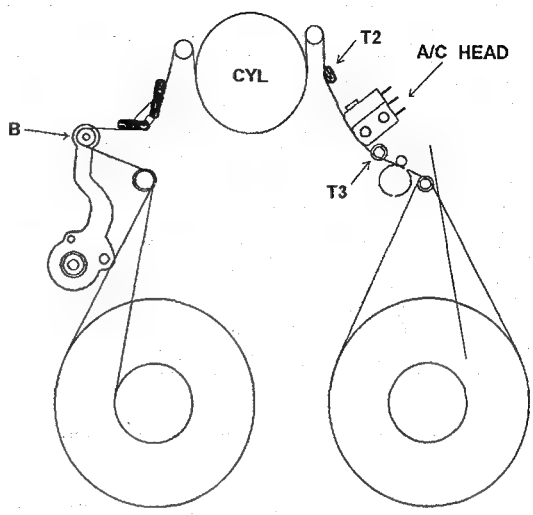
1-16. A/C Head Tilt Adjustment

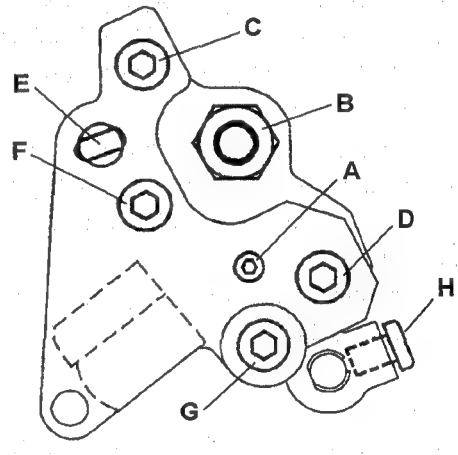
SPEC	Lower limit at T3 Post No tape curl
ADJUSTMENT	SCREW A and G (A/C Head)
MODE	PLAY
TAPE	Blank Tape
M.EQ	VFK1148, VFK1178(Hex Driver)

1. Play back the tape and adjust **screw(A)** for adjustment of tilt of A/C Head so that the tape path has lower limit without curl at T3 post.
2. To adjustment, loosen the screw (G) and make curl on tape at lower flange of T3 post by screw (A). And tighten screw (A) accordingly for find the point of curl disappeared. After finish adjustment for screw (A), tighten the screw (G) is tightened with 1.0Kg/cm of torque.

(NOTE)

1. In case of turn clockwise screw (A).
   → Tape goes up at T3 post.
   In case of turn counter-clockwise screw (A).
   → Tape goes down at T3 post.
2. When screw adjustment finished, with each adjustment screw on A/C Head should be finished tighten direction. And confirm that the screw does not loosen.
3. Adjust and confirmation should be performed alternately with each A/C head adjustment(Azimuth and Height).





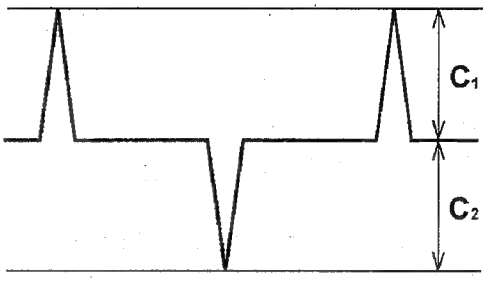
1-17. A/C Head Height adjustment

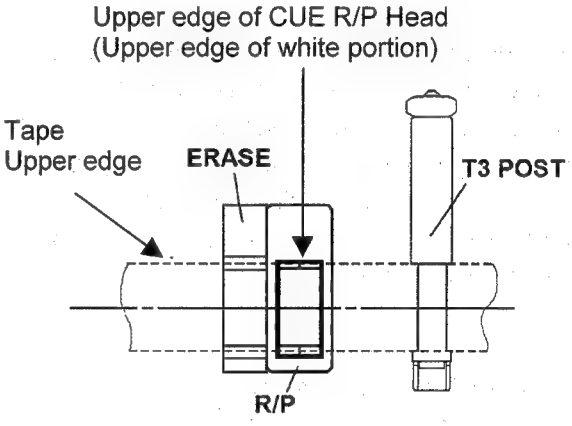
BOARD	SERVO
SPEC	CTL Output (C1,C2≧220mV)
TEST POINT	TP107:CTL
ADJUSTMENT	SCREW B and H (A/C Head)
MODE	PLAY
TAPE	VFM3580KM, VFM3680KM
M.EQ	Oscilloscope
TOOL	VFK1150(Nut Driver) VFK1190(Hex Wrench)

1. Observe the CTL output (**TP107**) on the Servo board.
2. Press and Lift up to A/C Head lightly as indicated as figure position, then confirm that the **CTL** output level is **decreased**.
3. If increases CTL output, when press the A/C Head. Loosen the **screw H** and adjust the **screw B counterclockwise** until CTL output is maximized.
4. If increases CTL output, when lift up the A/C Head. Loosen the **screw H** and adjust the **screw B clockwise** until CTL output is maximized.
5. After tightening the **screw H(2.0kg)**, confirm the level again.

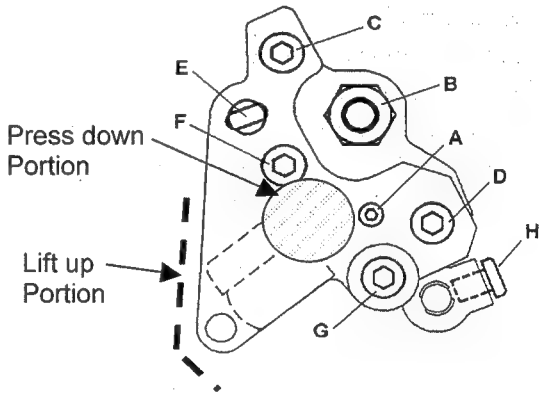
< NOTE >

1. Adjust alternately with other A/C head adjustments(Azimuth, Height).





A/C HEAD HEIGHT



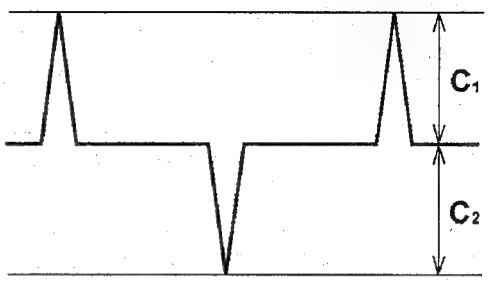
1-18. A/C Head Azimuth Adjustment

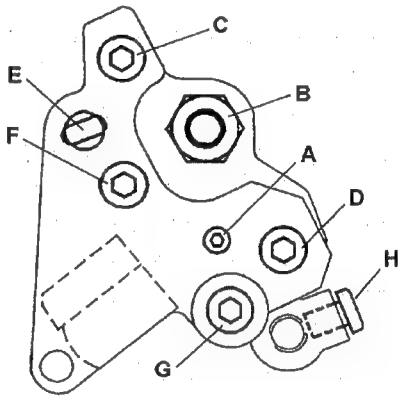
BOARD	SERVO
SPEC	CTL Output:C1,C2 = C1 max, C2 max
TEST POINT	TP107:CTL
ADJUSTMENT	SCREW F (A/C Head)
MODE	PLAY
TAPE	VFM3580KM, VFM3680KM
M.EQ	Oscilloscope
TOOL	VFK1148(Hex Driver)

1. Observe the CTL output (TP107) on the Servo Board.
2. To adjustment, loosen the screw (G) and adjust screw (F) so that the CTL output become maximum.
3. Tighten screw (G) with 1.0Kg torque.

< NOTE >

1. Adjust alternately with other A/C head adjustments(Azimuth, Height).

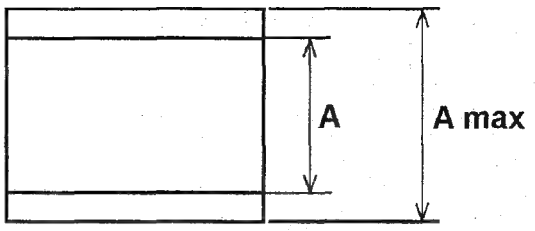


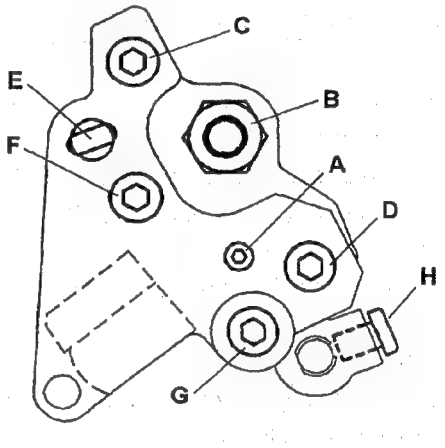


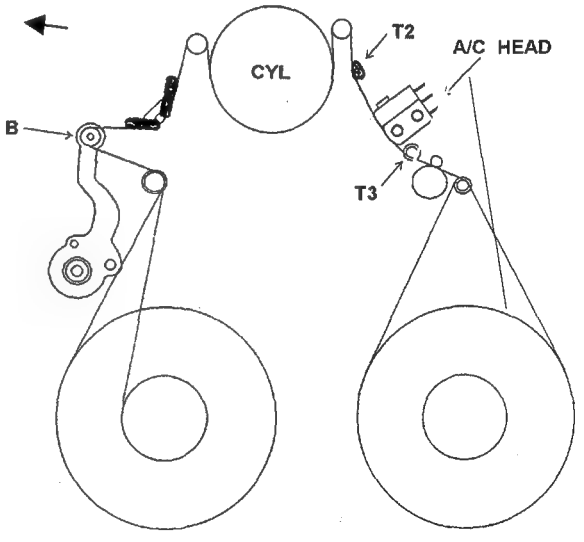
1-19. A/C Head Tilt Confirmation

SPEC	A/Amax ≧ 0.8
TEST POINT	TP505:CUE AUDIO(LCD Board)
ADJUSTMENT	SCREW A and G (A/C Head)
MODE	PLAY
TAPE	VFM3580KM, VFM3680KM
M.EQ	Oscilloscope
TOOL	VFK1178, VFK1148(Hex Driver)

1. Playback the CUE portion(6kHz) of the Alignment tape.
2. Confirm that the **screw G** and **H** are not loosened.
3. Push the tension arm follow the arrow (B) direction as shown in figure as range of T2 post does not move. And confirm that the CUE output level is within specification.
4. If out of specification, loosen the **screw G** and adjust the **screw A**, then tighten the **screw G** with **1.0kg** torque.
5. The final touch of the adjustment must be turned clockwise. After this adjustment, confirm that the screw A is not loosened.
6. If adjust the screw A, Confirm that the tape pass condition follow Post Limit Confirmation procedure (item 1-14).



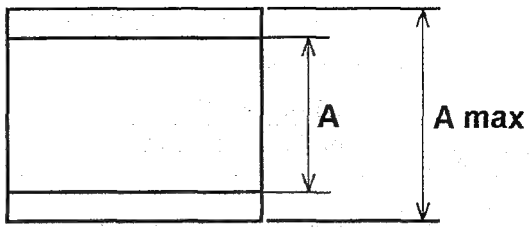


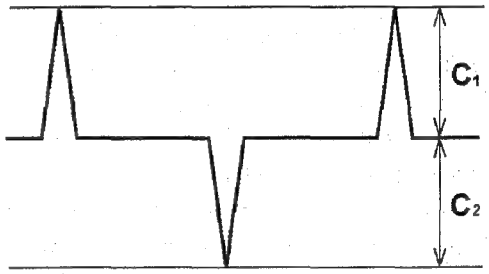


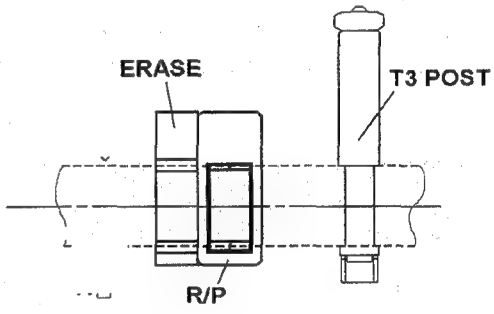
1-20. A/C Head Height Confirmation

SPEC	A≧0.95×Amax、C1、C2 ≧ 220mV
TEST POINT	TP505 CUE AUDIO(LCD BOARD) TP107 CTL(SERVO BOARD)
ADJUSTMENT	SCREW B and H(A/C Head)
MODE	PLAY
TAPE	VFM3580KM, VFM3680KM
M.EQ	Oscilloscope
TOOL	VFK1150(Nut Driver) VFK1190(Hex Wrench)

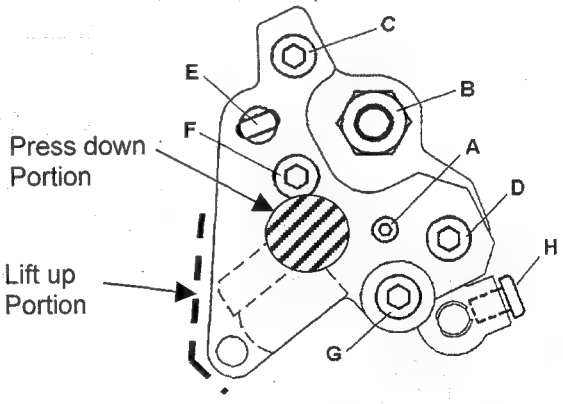
1. Playback the CUE portion(6kHz) of the Alignment tape.
2. Press and Lift up to A/C Head lightly as indicated as figure position, then confirm that the CUE output level at TP505 does not in**creased**.
3. If increases CUE output, A/C Head Height adjustment performed. And also confirm that the CTL output level.
4. If adjust the height of A/C Head, Azimuth also changed. Therefore adjust and confirm alternately Height and Azimuth of A/C Head.
5. After screw (H) is tightened, height and tilt of A/C Head are changed. Therefore confirmation of specification must be done after tightening the screw (H).







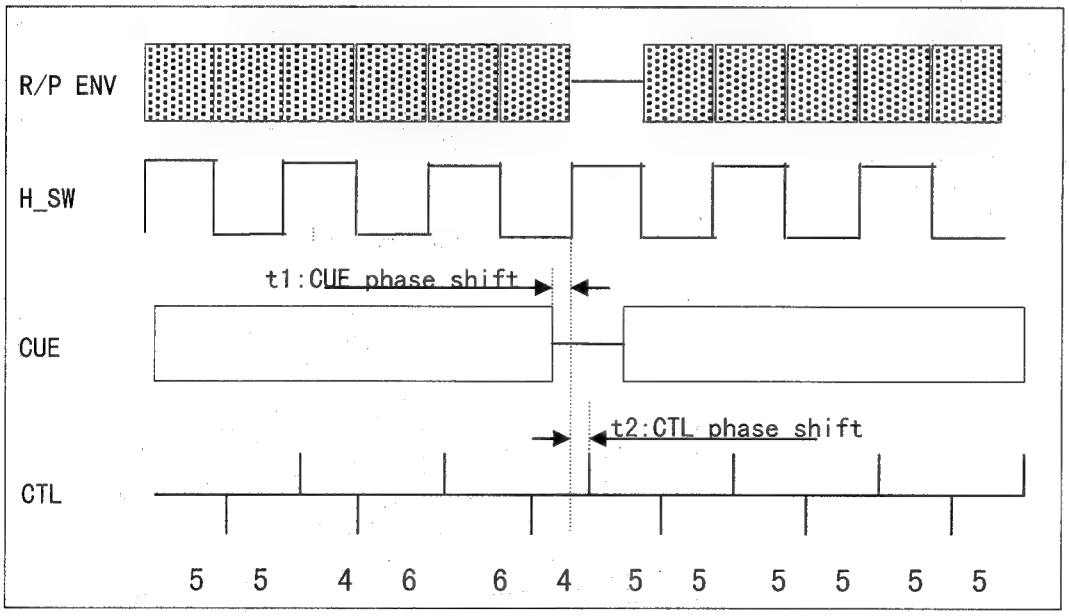
A/C HEAD HEIGHT

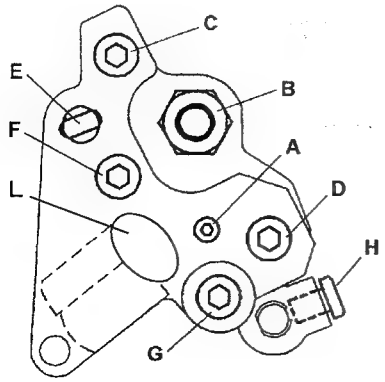


1-21. A/C Head Azimuth and X-value Adjustment.

SPEC.	AS shown in the below figure. -250us≦t1≦+250us -250us≦t2≦+250us	TEST POINT	TP500:R/P ENV(RF Board) TP300:R/P HSW (RF Board) TP505:CUE AUDIO (LCD Board) TP107:CTL (SERVO Board)
ADJUSTMENT	A/C Head each screws	M.EQ	Oscilloscope
MODE	Play	TOOL	VFK0357(Eccentric Driver)
TAPE	VFM3582KM, VFM3682KM		

1. Playback the X-value alignment tape.
2. Adjust A/C Head Azimuth (refer to Azimuth adjustment procedure) so that the CTL and Lack part of CUE(t2) is match in the phase.
3. Confirm the lack track of envelope, and select the HSW correspond with it (The lack track is correspond HSW high with L ch).
4. Adjust X-value so that the reference of HSW and CTL trigger (select the next trigger at duty 6 to 4 portion: refer to below figure) are match in the phase(t1). To adjust X-value, loosen the screw C and D, adjust the hole E by VFK0357. After adjustment tighten the screw C and D with 2.5Kg torque. At this time adjust the phase simultaneously with Azimuth so that the CTL and CUE phase is kept.
5. Hit the top plate (portion L as shown in below figure) of A/C Head lightly by a pointed end of Eccentric driver , then confirm the phase is not shifted finally.





1-22. REV Tape Pass Confirmation and Adjustment (T4 post height adjustment)

SPEC.	C1、C2≧Cp1、Cp2×0.75 Lower limit at T3 post on REV mode	**TAPE**	VFM3580KM, VFM3680KM
TEST POINT	TP30(SERVO:F1)	**M.EQ**	Oscilloscope
ADJUSTMENT	T4 post height	**TOOL**	VFK1151(Nut Driver)
MODE	REV×1		

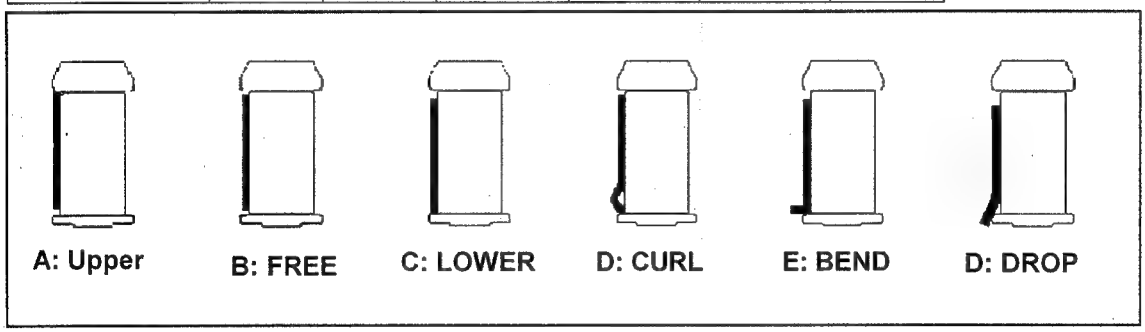
1. Place unit into REV mode, and confirm the post limit and CTL signal are in the specification. IF not, adjust T4 post follow the below procedure.
2. Turn the Nut of T4 post clockwise or counterclockwise follow the tape limit condition at T3 post. The maximum rotation angle is 90 degree.
3. Place unit into REV X1 mode and confirm the CTL output level is become more than 75% on play mode. Confirm the tape pass limit become lower limit at T3 post and the tape does not have curl at T3 and T4 post.
4. However out of specification, adjust T4 post height follow the Post Height Pre-adjustment procedure.

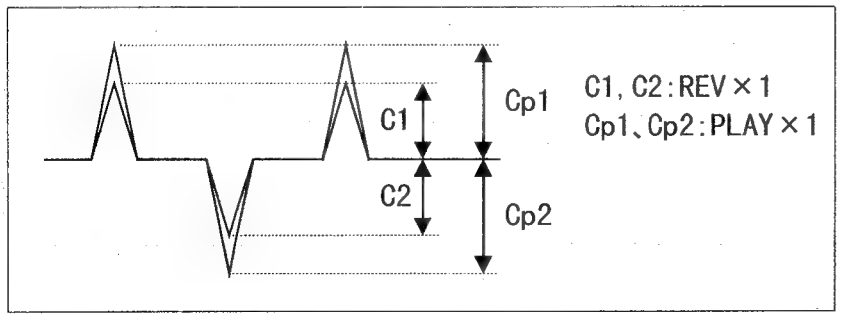
T4 Nut adjustment direction

Direction of adjustment nut of T4 post	CTL level on REV mode	Lower limit at T3 post On REV mode
Tighten direction	Increase	Tape touch to strong
Loosen direction	Decrease	Tape touch to weak

Post Limit

Post Name	Tape limit					
	A	B	C	D	E	F
T3 Post	×	×	○	×	×	×
T4 Post	○	○	○	×	×	×





1-23. CTL Self Recording Level Confirmation

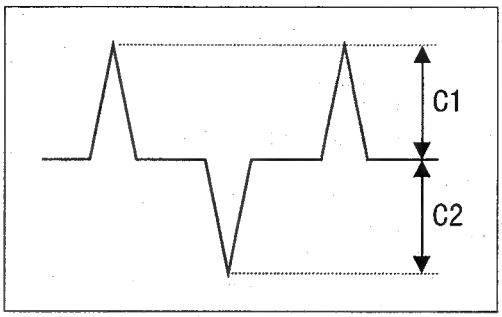
SPEC.	Refer to below table
TEST POINT	TP107 (SERVO Board)
MODE	REC and PLAY
TAPE	Blank tape
M.EQ	Oscilloscope

NOTE: This confirmation should be done after each screws of A/C Head are fixed.

1. Record the blank tape.
2. Playback the recorded portion and confirm the CTL level is within specification as shown as below table on PLAY and REV X1 mode.

CTL Output Level C1,C2	
PLAY	REV × 1
C1,C2≧220mV	C1,C2≧170mV

1. PLAY NG → Re-confirm the A/C Head height adjustment.
2. REV NG → Re-confirm the T4 post adjustment.

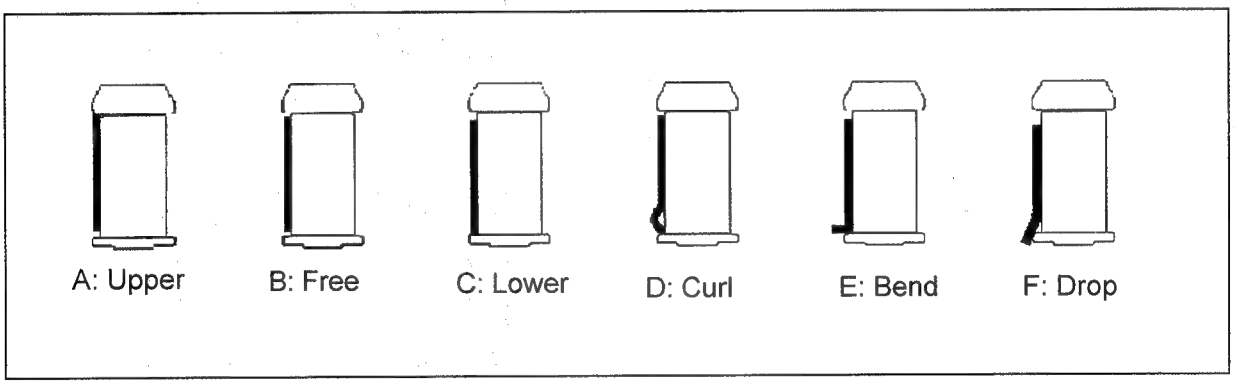


1-24. PLAY Tape Pass Limit Confirmation

SPEC.	Each Post limit shown in table
MODE	PLAY
TAPE	M cassette (MP tape) tape. Tape beginning and end portion

Post Name	Tape Limit (Refer the figure)						Adjustment	
	A	B	C	D	E	F		
S5 post	X	O	O	X	X	X	S4、S5 Post	Post Height Pre-Adj.
S4 post	X	X	O	X	X	X		
S1 post	O	X	X	X	X	X	S1 Post	Envelope waveform Adj.
T1 post	O	X	X	X	X	X	T1 Post	Envelope waveform Adj.
T3 post	X	X	O	X	X	X	A/C Head tilt	A/C Head tilt Adj.
T4 post	X	O	O	X	X	X	T4 Post	Post Height Pre-Adj

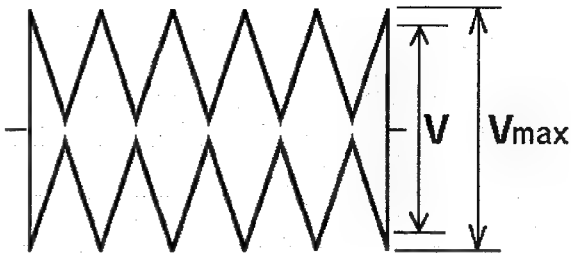
1. Place unit into PLAY mode and confirm the each post limits is within specification.
2. If out of specification, adjust the post height follow the each adjustment procedure (Refer to above table).



1-25. Confirmation of Envelope on REV,REW and FF mode.

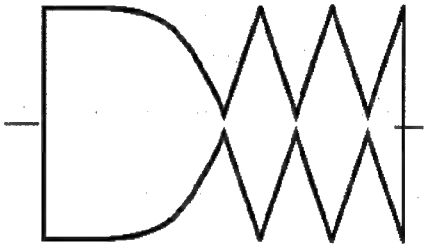
SPEC.	V/Vmax ≧ 0.9
TEST POINT	TP500 R/P ENV (RF Board)
MODE	REV、REW、FF
TAPE	VFM3580KM, VFM3680KM
M.EQ	Oscilloscope

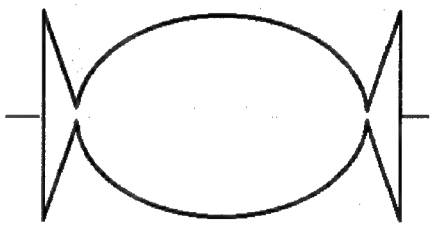
1. Confirm that the Envelope waveform becomes in the specification on REV,REW and FF mode as refer to figure and below.
   - Waveform must be Diamond Style.
   - All the peak level must be more than 90% of maximum level.
     V/Vmax ≧ 0.9
2. If out of spec, adjust S4 post height.



OK

NG





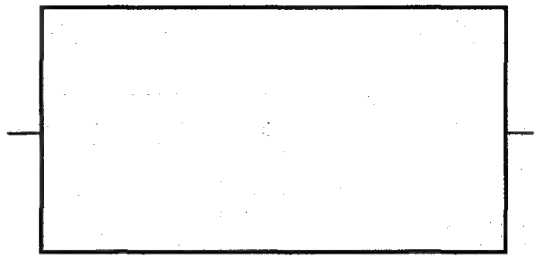
1-26. Confirmation of Play Start Envelope

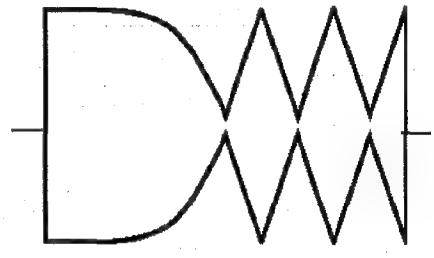
TEST POINT	TP500 R/P ENV (RF BOARD)
MODE	REW/REV → PLAY Loading completion → PLAY FF → PLAY
TAPE	M cassette(63min、Recorded tape) Tape beginning portion
M.EQ	Oscilloscope

Note: This adjustment must be done after Envelope Waveform Adjustment.。

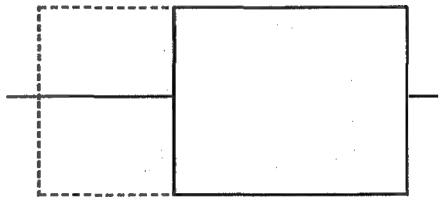
1. Confirm that the envelope appears immediately, when the mode is changed from REW to PLAY、REV to PLAY、FF to PLAY、and Lording to PLAY mode.
2. If out of spec, adjust S4 post height.

O K





N G

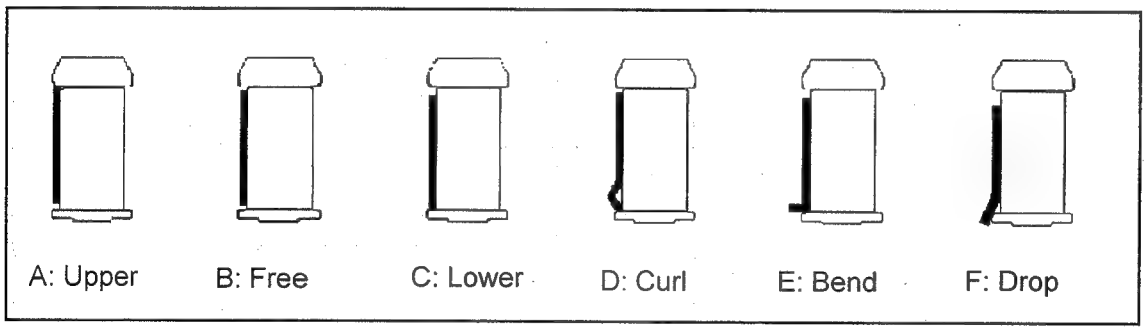


1-27. Tape Pass Limit Confirmation

SPEC	Each Post limit shown in table.
MODE	REV
TAPE	M cassette (MP tape) tape. Tape beginning and end portion

Post Name	Tape Limit(Refer to figure)					
	A	B	C	D	E	F
S5 Post	O	O	O	X	X	X
S4(Tension) Post	X	O	O	X	X	X
S1 Post	O	X	X	X	X	X
T1 Post	O	O	O	X	X	X
T3 Post	X	X	O	X	X	X
T4 Post	X	X	O	X	X	X

1. Place unit into REV mode and confirm the each post limits is within specification.
2. If out of specification, adjust the post height follow the each adjustment procedure (Refer to above table).



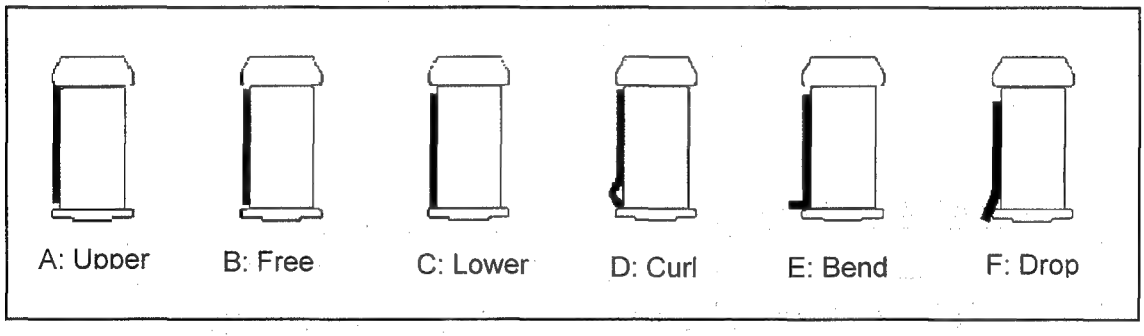
1-28. FF、REW Tape Pass Limit Confirmation

SPEC.	Each Post limit shown in table.
MODE	FF,REW
TAPE	M cassette (MP tape) tape. Tape beginning and end portion

Post Name	Tape Limit(Refer to figurte)					
	A	B	C	D	E	F
S5 Post	O	O	O	X	X	X
S4(Tension) Post	X	O	O	X	X	X
S1 Post	O	X	X	X	X	X
T1 Post	O	O	O	X	X	X
T3 Post	O	O	O	X	X	X
T4 Post	O	O	O	X	X	X

1 Place unit into FF and REV mode and confirm the each post limits is within specification.

2. If out of specification, adjust the post height follow the each adjustment procedure (Refer to above table).

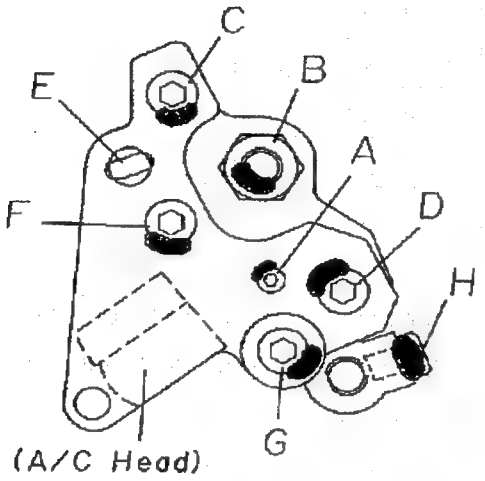


1-29. Screw Lock Tight of A/C Head and T3, T4 Post

[Screw Lock Tight of A/C Head]

	SCREW A	OTHER SCREW
Lock Tight Grew Quantity	1/3 of the screw	1/3 of the screw

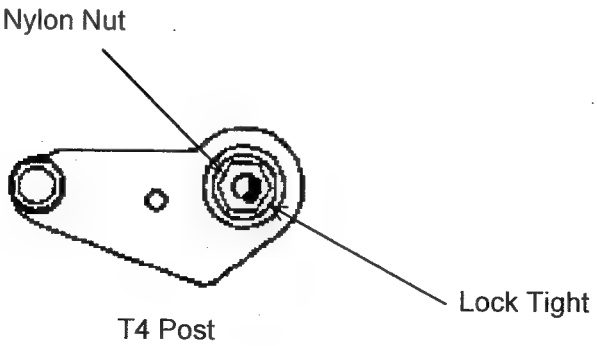
1. Fix the screw by the Lock Tight Grew after adjustment..
2. Before adjustment melt the Grew.



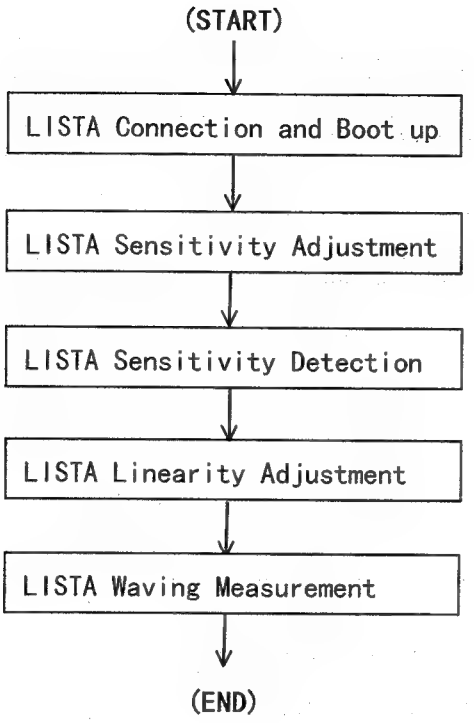
[Screw Lock Tight of T3 and T4 Post]

	T3 Post	T4 Post
Lock tight grew quantity	1/4 of the screw	1/4 of the screw

1. After adjustment, attach the lock tight grew at the Nylon nut..
2. Before adjustment, melt the Grew.



1-30. LISTA Adjustment Procedure.



1-31. LISTA Connection and Boot Up

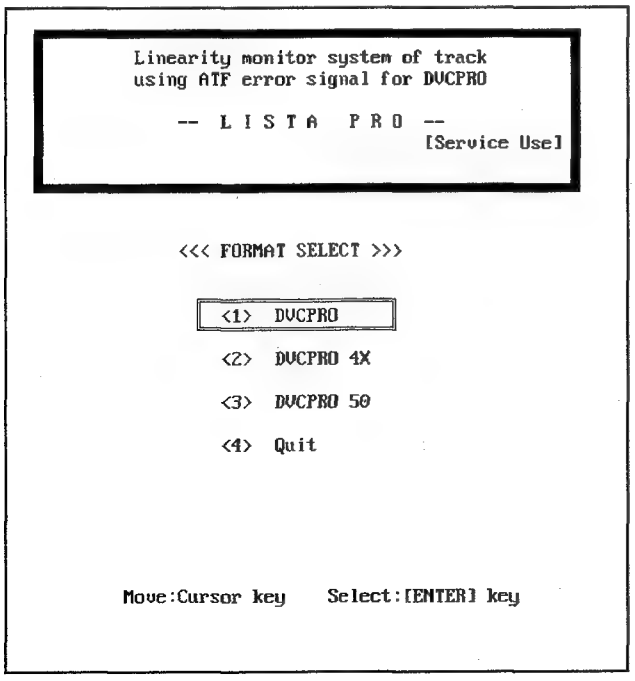
TEST POINT	TP601:ATF ERR (SERVO Board) TP113:R/P HSW (SERVO Board) TG300:GND (SERVO Board)
M.EQ	P/C (AD Board should be installed),Oscilloscope
TAPE	VFM3581KM, VFM3681KM
TOOL	VFK1481(LISTA Software),VFK1186(LISTA Cable)

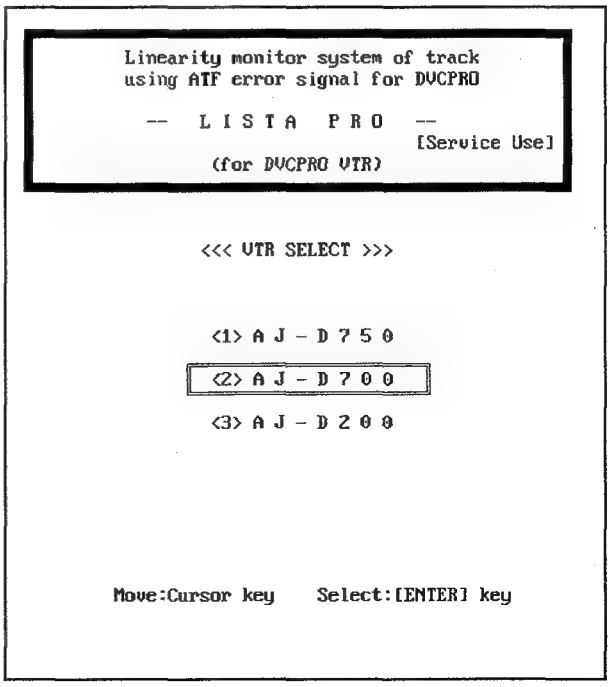
1. Connect the LISTA Cable to A/D board on PC.
2. Connect the Clips of LISTA Cable to test point on Servo Board as follow as below.
   ①.ATF : TP601
   ②.HSW : TP113
   ③.GND : TG300

3. Boot up the LISTA software on DOS mode.

★ Install and Boot up.
All files on the floppy disk (VFK1481) copy to created directly on PC(**i.e.** C:¥LISTA).
Type "LISTA " and press ENTER Key, then boot up the LISTA software.

4. Select the item " DVC PRO " then " AJ-D700 " for selected model on the menu. (AJ-D400P/E / D700P/E is equivalent to AJ-D700).
5. After selected model, appeared alignment tape data on the screen for select the Serial number on the alignment tape. But if LISTA software have not resisted data of alignment tape, press the ESC key, then main menu is display on the screen. And select item " <4> Alignment Tape" for entry the data on the attachment sheet, which is enclosed of alignment tape.





1-32. How to Entry the Attachment Data of Alignment Tape

1. Select the item " <4> Alignment Tape " on the main menu of the LISTA software.
2. Select the item " <2> ENTRY " on the alignment tape menu.
3. After display the screen of " << Alignment tape Data Entry >> ", first input the Serial number follow the printed number on the tape label. And input the number "0" or "1" for select the PAL/NTSC. And after that for entry the tape type, in case of DVCPRO input to "0" , in case of DV input to "1".
4. After select the Tape type, the frame for input the DATA and CHECK SUM appeared on the screen. Input the numerical value in numerical order on the data sheet, which are enclosed with alignment tape. If input the wrong number, appear the error message on the screen, then confirm that the data on the sheet.
5. After entry the data, select " <1> SELECT " on the Alignment Tape menu and select the serial number of the alignment tape.

<<Alignment Tape Data Entry>> Serial No. 0596003(NTSC) 18um

[1]	- 0.1
[2]	0.1
[3]	0.0
[4]	0.2
[5]	0.6
[6]	0.5
[7]	0.7
[8]	0.9
[9]	1.0
[10]	0.8

[11]	0.7
[12]	1.0
[13]	0.7
[14]	0.5
[15]	0.2
[16]	- 0.5
[17]	- 0.3
[18]	- 0.3
[19]	- 0.1
[20]	- 0.6

[21]	- 0.4
[22]	- 0.2
[23]	- 0.7
[24]	- 0.6
[25]	- 0.7
[26]	- 0.3
[27]	- 0.4
[28]	- 0.4
[29]	- 0.6
[30]	- 0.3

[31]	- 0.4
[32]	- 0.6
[33]	- 0.3
[34]	- 0.2
[35]	- 0.1
[36]	- 0.3
[37]	- 0.1

[CS]	- 0.6

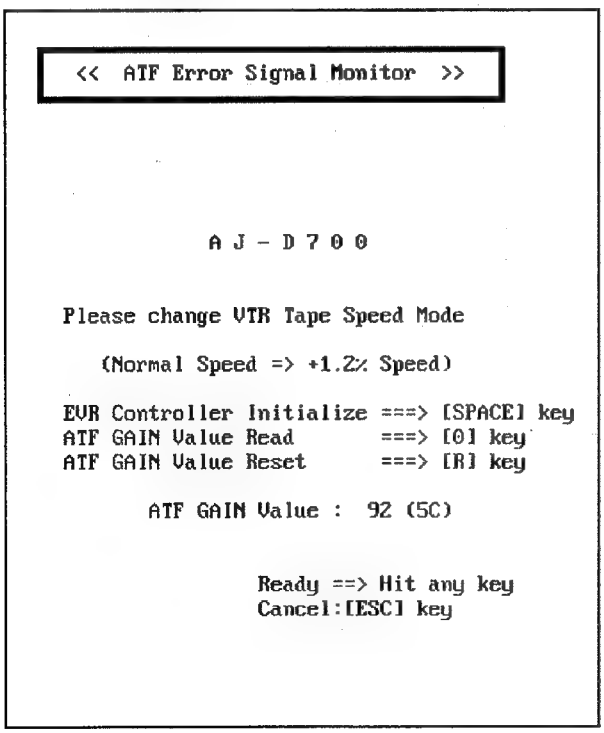
1-33. LISTA Sensitivity Adjustment

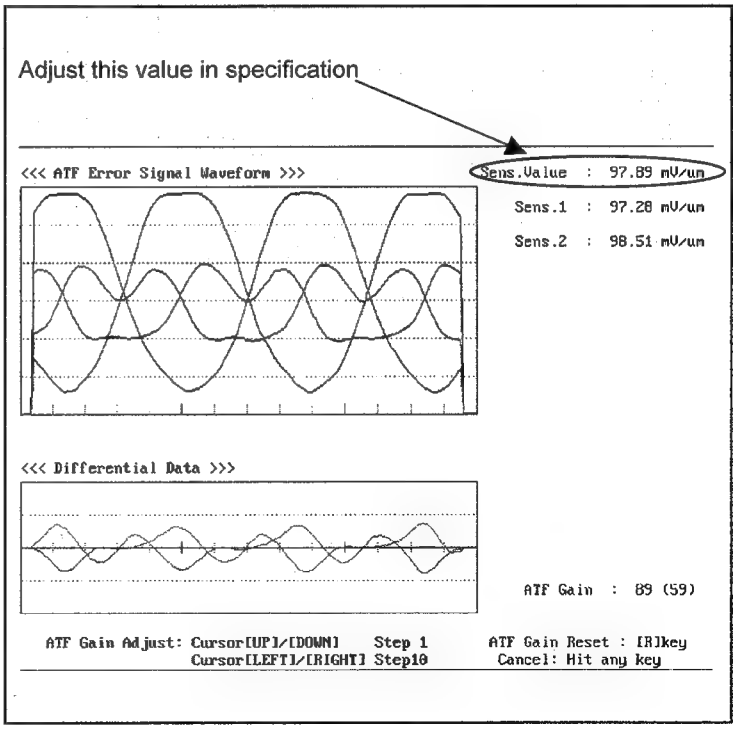
SPEC.	Sensitivity:100±10 (mV/um)
MODE	PLAY
TEST POINT	TP601:ATF ERR (SERVO Board) TP113:HSW (SERVO Board) TG300:GND (SERVO Board)
ADJUSTMENT	EVR(ATF Gain):refer to below sentence about how to adjustment
TAPE	VFM3581KM, VFM3681KM

1. Set up the EVR tool according to Connection figure at the beginning of Electrical Adjustments.
2. Confirm that the power is turned off and make a short-circuit between **TP902** and **TP116** to place the unit in +1.2% Playback mode.
3. After turn on Power and Playback an alignment tape.
4. Select the "**<6> ATF Error Signal Monitor**" on the main menu. And than press **"SPACE"** key for executes initializes.
5. Press the **"0 (zero)"** key for download the ATF GAIN DATA from the unit.
6. Press the **"ENTER"** key, then sensitivity value as real time and waveform appears on the screen as shown in figure.
7. Press the kry in PC so that the sensitivity value which is described as **Sens. Value** is within specification.

Note: Data is changed 10 steps by press [→] and [←] keys.
Data is changed 1 steps by press [↓] and [↑] keys.
After press arrow key, screen displays disappeared momentary during calculation on LISTA software.

8. After the adjustment, press ESC key to exit to the menu.

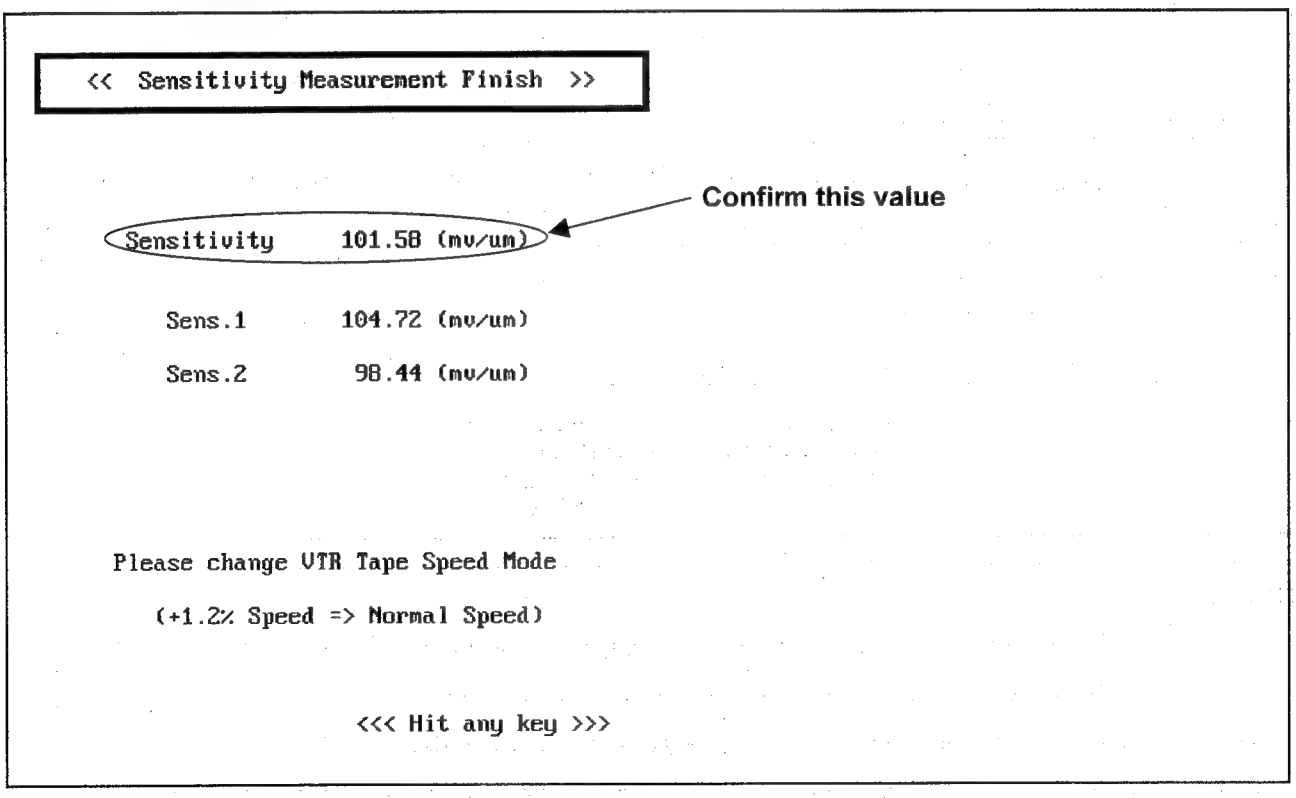




1-34. LISTA Sensitivity Detection

SPEC	Sensitivity:100±10 (mV/um)
MODE	PLAY
TEST POINT	TP601:ATF ERR (SERVO Board) TP113:HSW (SERVO Board) TG300:GND (SERVO Board)
ADJUSTMENT	
TAPE	VFM3581KM, VFM3681KM

1. Confirm that the power is turned off and make a short-circuit between **TP902** and **TP116** to place the unit in +1.2% Playback mode.
2. Turn on the Power and playback an alignment tape.
3. Select the " **<1>Sensitivity Measurement"** on the main menu and after appear the message " 1.2% Speed... " , press ENTER key, then LISTA software start measurement of sensitivity value.
4. Confirm that the sensitivity value is within specification, when the message << Sensitivity Measurement Finish>> and 「Sensitivity = numerical value」 are displayed on the screen.
5. If out of specification, repeat the steps 3 and 4.
6. If still out of specification, make "LISTA Sensitivity Adjustment again.

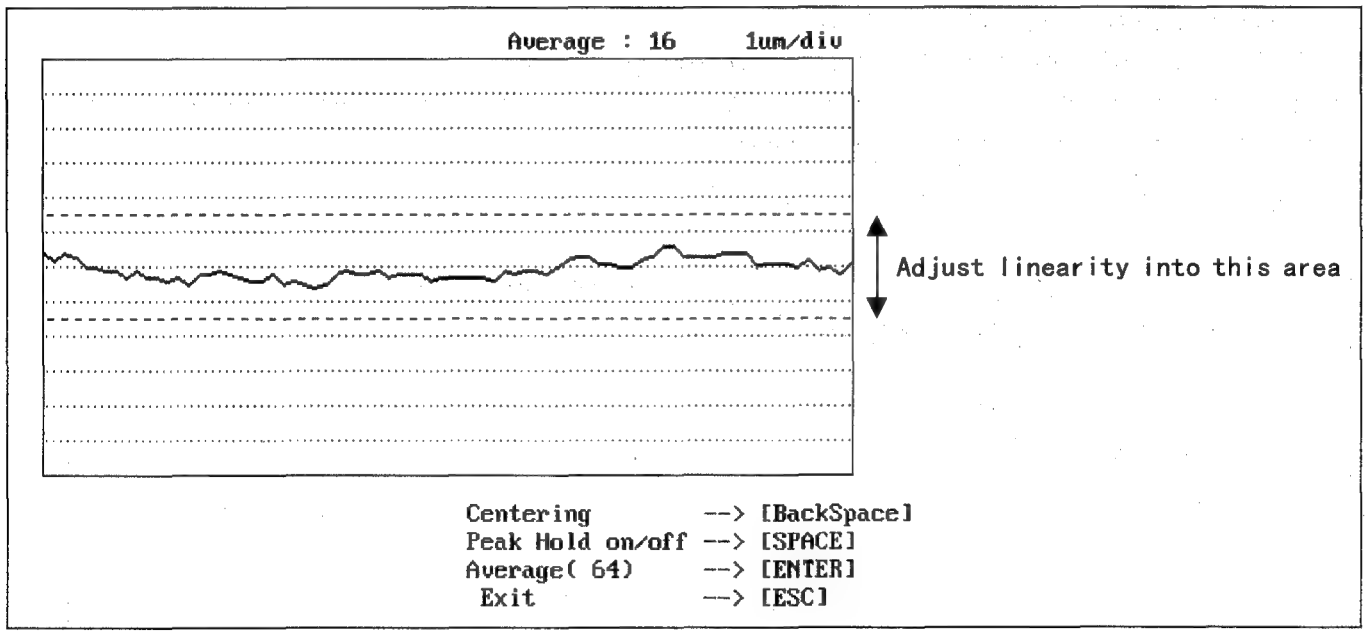


1-35. LISTA Linearity Adjustment and Waving Measurement.

SPEC	Linearity: Less than 3um, Waving: Less than 1.5um
MODE	PLAY
TEST POINT	TP601:ATF ERR (SERVO Board) TP113:HSW (SERVO Board) TG300:GND (SERVO Board)
ADJUSTMENT	S1 and T1 Post Height
TAPE	VFM3581KM, VFM3681KM

1. Confirm that the power is turned off and make a short-circuit between **TP902**, **TP116** and **TP101** to place the unit in LISTA Linearity mode.
2. Turn on the power and playback an alignment tape.
3. Select the item 「(2) Linearity Measurement」 on the LISTA main menu and display the linearity waveform.
4. When the waveform as shown as below figure is displayed on the screen, press the " BS (back space) " key for display the waveform to center of scale on the screen. And adjust height of S1 and T1 post by Post Driver so that the linearity waveform is become flat as possible, and it should be in the specification.

★ Adjust linearity waveform in the red dot line on the screen.



☆ POINT:

The part of left side of waveform(entrance side) is adjusted by height of S1 post and part of right side of waveform(exit side) is adjusted by height of T1 post.

Lower part of above waveform of figure is displayed lead on Cylinder.

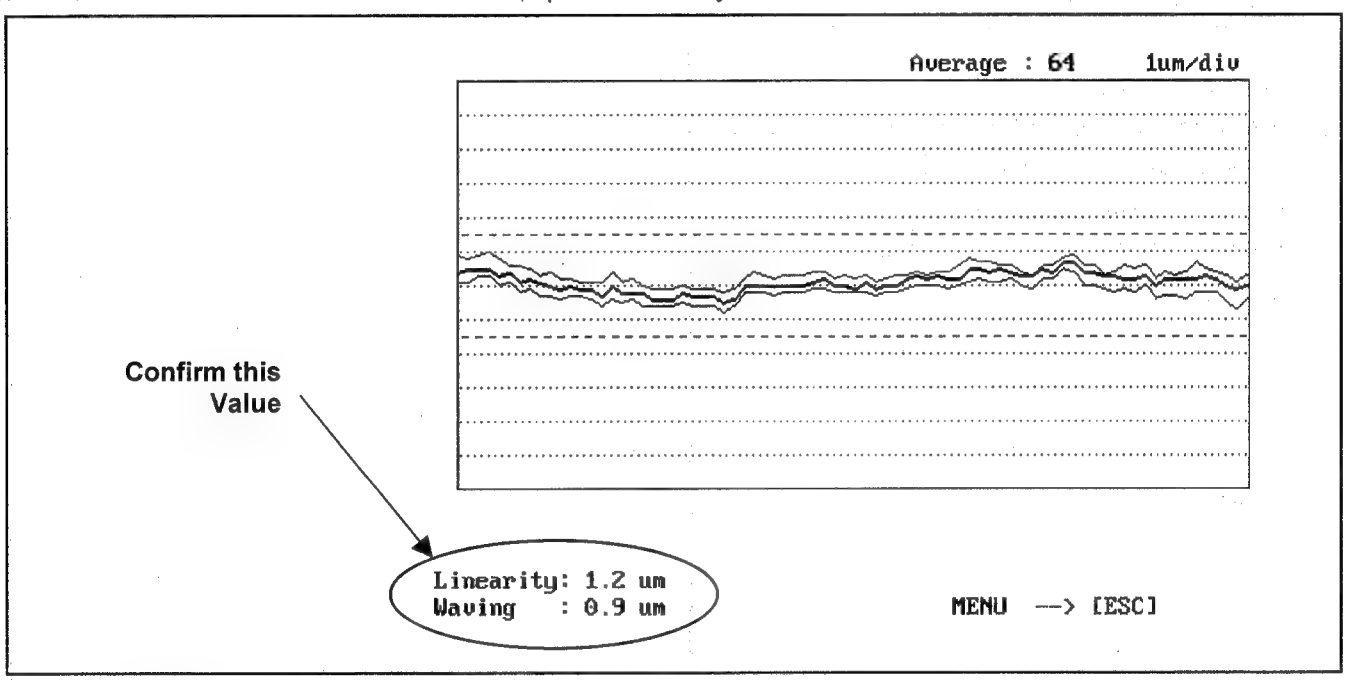
When the post driver is remove from upper part of post, linearity waveform is changed.

After finish this adjustment, eject the tape and insert the tape again for confirm the shape of linearity waveform does not changed.

5. After finish the linearity adjustment, measure the numerical value of linearity and waving.

＊[Waving Measurement]

1. Press "SPACE " key for make the Peak Hold during 30 seconds, when linearity is displayed.
2. After finish the Peak Hold, press "SHIFT" and "}" ,key simultaneously on the Key Board, then display the numerical values of 「Linearity」 and 「Waving」 on left lower portion of screen. And confirm the numerical values are in the specification. Also confirm the range of waving waveform is same quantity from entrance side to exit side. If the 「Linearity」 and 「Waving」 are out of specification and it caused by not enough limit of entrance or exit side of envelope, then adjust height of S1 and T1 post.
3. After this measurement is finished, press ESC key for return to main menu.



＊NOTE: Saving of LISTA Data

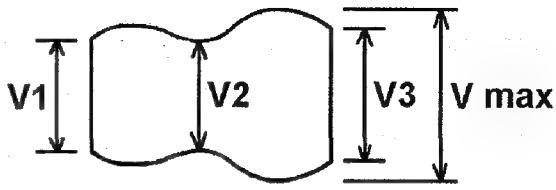
The LISTA software can be saved linearity waveform and measurement value of linearity and waving as one file data to PC.

1. Basically this operation should be performed after linearity and waving measurement finished.
2. Select the item 「(3) Data Save/Load 」 on the LISTA main menu. And after open the menu select the item 「<1> Save」.
3. The linearity waveform as Peak Hold displayed on the screen. And after appeared message "File Name? " on the screen, entry the File Name and Comment. File Name must be in 8 characters, and comment is must be in 20 characters. As comment, entry the Serial Number, VTR Model Number and Head Rotation Hours etc, for use management of linearity data of each VTR.
4. After completion of saving, select the item 「<2> Load」 on the 「(3) Data Save/Load」 menu, then appear the saved File Name on the screen. And select it previous saved file for confirm the waveform and numerical value displayed correctly. By press "SHIFT" and "}" ,key simultaneously on the Key Board., then display the numerical values of 「Linearity」 and 「Waving」 on left lower portion of screen.

1-36. Self-Recording Playback Envelope Waveform Confirmation

SPEC	V1/Vmax、V2/Vmax、V3/Vmax ≧ 0.8
TEST POINT	TP500 R/P ENV (SERVO Board) TP300 R/P HSW (SERVO Board)
ADJUSTMENT	S1 and T1 Post Height
MODE	PLAY
TAPE	Blank Tape
M.EQ	Oscilloscope
TOOL	VFK1149(Post Driver)

1. Record the color bar signal.
2. Play back the recorded portion and confirm that the envelope output is within specification
3. If out of specification, perform the Envelope Waveform and LISTA adjustment again.



SECTION 4

ELECTRICAL ADJUSTMENT

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Electrical Adjustment Procedures

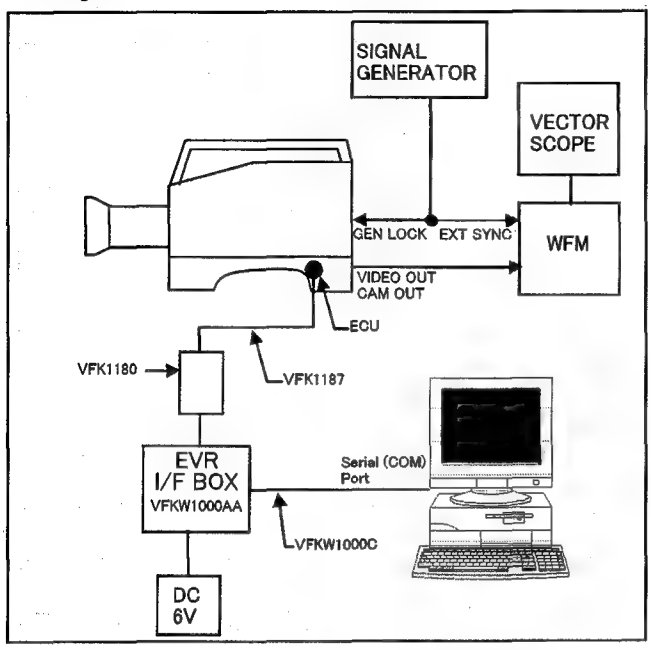
Recommended Test and Measuring Equipment

The following test and measuring equipment are required to conduct the electrical adjustments.

Model No. or Equivalent	Equipment	Remark
	Dual Trace Oscilloscope	More than 400MHz
1750,1760 or 1780R(NTSC) 1751,1761 or 1781R(PAL) TEKTRONIX	WFM (Wave Form Monitor)	
1750,1760 or 1780R(NTSC) 1751,1761 or 1781R(PAL) TEKTRONIX	Vector Scope	
1750,1760 or 1780R(NTSC) 1751,1761 or 1781R(PAL) TEKTRONIX	SCH Meter	
	Audio Analyzer	
	Digital Volt Meter (D.V.M.)	
	Frequency Counter	
MINOLTA	Color Pyrometer and LUX Meter	20 - 20,000LUX
VFK0645	Grayscale Chart	11 Steps, Gamma=0.45 Black=2.0% Reflection
	Lighting	2000LUX, 3200° K (500W)
PORTA PATTERN	Light Box (Spherical Type)	White Flat Pattern without any Shading
	Transparency Charts (Inmega chart) for Light Box	
VFK1194	Extension Board	
CANON or FUJINON	Zoom Lens	With Extender (~x2) & Ratio Converter (x0.8)
VFM3580KM (for NTSC) VFM3680KM (for PAL)	Alignment Tape	
VFM1423	Tape Begin / End Det. Cassette	No capability

Setup of EVR Tool

1. Turn the power switches of the camera recorder and the EVR off. Connect the tools as shown in figure.



2. Turn the power of PC and EVR ON and then camera recorder ON.
3. Pressing [SHIFT],[+] and [-] buttons in operation panel, set the MENU SW to SET.
4. Press the PAGE button to open the SERVICE ADJ. menu. Select EVR in ECU CONNECT. After setting turn the MENU OFF.
5. Execute the CAM_TOOL.EXE on command prompt condition to start EVR program.
6. Follow the displayed instructions until MAIN MENU is shown. (If the bar graph stops before 100% and MAIN MENU is not opened, turn the power of I/F box (VFKW1000AA) OFF and ON. Then execute the EVR program again.)

Function (Ver.3.2)

MAIN MENU

1. BACK UP (DOWN LOAD) RAM DATA.
2. RESTORE (UPLOAD) RAM DATA.
3. PREPARATION OF ADJUSTMENT.
4. START ADJUSTMENT.
5. ELECTRICAL ADJUSTMENT.
6. E.V.R. DIRECT FUNCTIONS.
7. BACK UP (DOWN LOAD) RAM DATA.< OPTION >
8. RESTORE (UPLOAD) RAM DATA < OPTION >
9. CREATE ADJUSTMENT ITEM <PRODUCTION>
10. START ADJUSTMENT <PRODUCTION>

1, 2 : NV-RAM DATA is backed up and restored. Back up data is named as --------. SAV. ".SAV" is automatically added. MENU data and adjustment data can be backed up.

3~5 : Not supported.

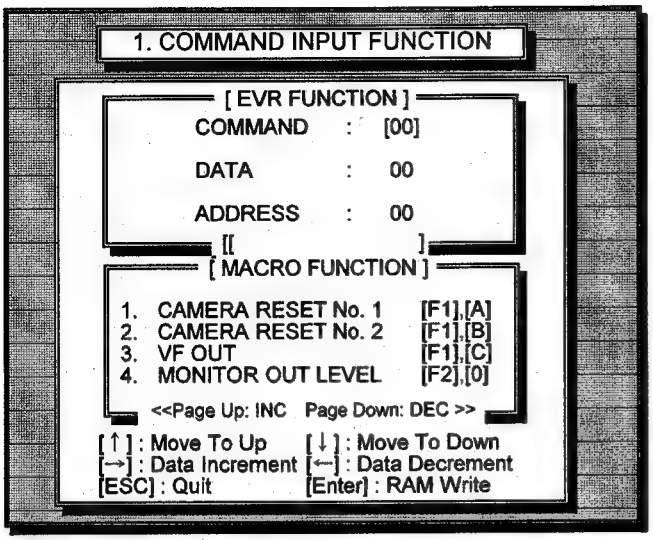
6 : Refer to next page.

7,8 : Blemish correction data can be backed up and restored The address is as follows. **5E60h-5E7Fh**

9. : Not supported.

10. : Refer to next page.

E.V.R. Direct Functions



1. Select <6.E.V.R. DIRECT FUNCTIONS> in MAIN MENU, and next selection appears.
2. Select <1.COMMAND INPUT FUNCTION>, and COMMAND INPUT FUNCTION menu is available as shown above.
3. Input COMMAND, DATA and ADDRESS according to adjustment procedure.
4. After adjustment, press [ESC] key to quit.

Note:
1. After operating EVR, turn the VTR off and on.
2. When the SYSCON PROM is updated, execute the CAMERA RESET No.1 in COMMAND INPUT FUNCTION menu. Press the [F1] and [A] keys together, and then press [ENTER] key.
3. The difference between CAMERA RESET No.1 and No.2;

No.1 : Adjustment data isn't reset. SETUP menu is reset.

No.2 : Adjustment data is also reset.

Start Adjustment

1. Select <10.START ADJUSTMENT> in MAIN MENU.
2. After selecting NTSC/PAL, press ENTER or ESC key to continue.
3. Adjustment items appear with command, data and address;

CMD DATA ADR AREA
[02] [00] [04] [00][FF]

CMD : Command.
DATA: Initial data. It is not factory data. It is not VTR data.
ADR : Address. Confirm the Service Manual that selected item is correct.
AREA: Adjustable range.

4. Select an adjustment item.
5. Following values are displayed;

Command = [02]
Data = [00]
Address = [04]
Read Data = [06]

Data : data to be sent to VTR.
Read Data : data sent from VTR.

6. To adjust VTR;
   1.Input data and press [ENTER] key.
   2.Press [+] or [-] key.
7. After adjustment, press [ENTER] key to quit.

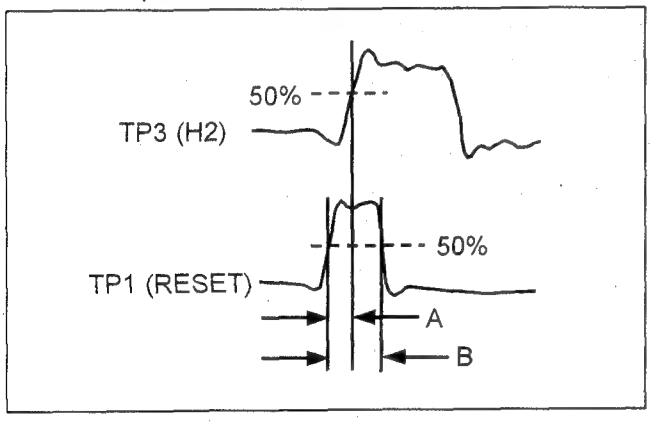
Note:
1. After operating EVR, turn the VTR off and on.
2. START ADJUSTMENT menu is possible to read out data from VTR.

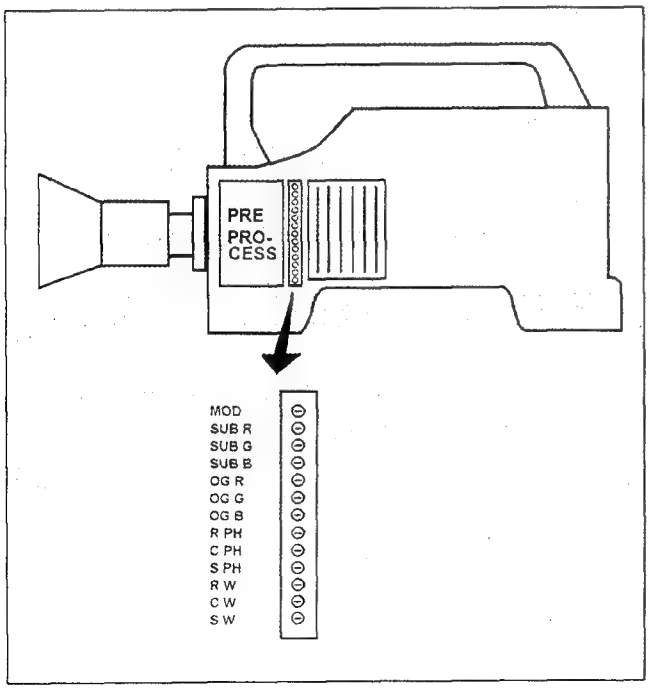
<Camera Section>
1. Head Optical Ass'y 1

1-1. Reset Pulse Adjustment

BOARD	Pulse
SPEC.	A = 5.0±1ns, B = 10.0±1ns
TEST	TP1 (R), TP3 (H2)
ADJUST	VR1 (R PH), VR4 (R W)
M.EQ	Oscilloscope

1. Remove the Head Optical Ass'y (camera unit).
2. Adjust the **VR4** so that the pulse **width B** at the **TP1** is within specification.
3. Adjust the **VR1** so that the phase **difference A** is within specification. (Trigger : TP3)





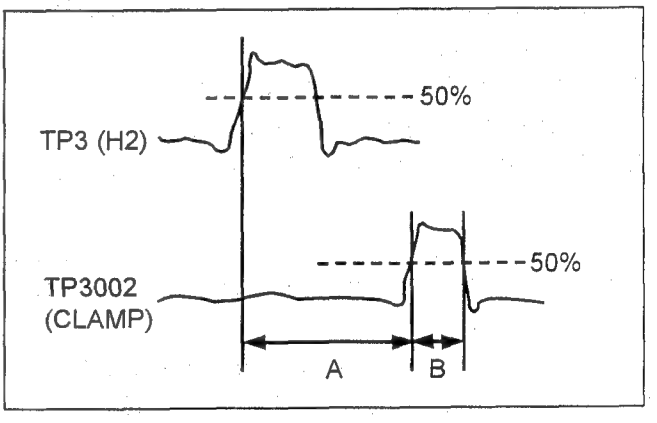
1-2. Clamp Pulse Adjustment

BOARD	Pulse
SPEC.	NTSC : A = 37.5±1ns, B = 19.0±1ns PAL : A = 39.0±1ns, B = 17.0±1ns
TEST	TP3002 (CLMP) (CDS Board), TP3 (H2)
ADJUST	VR2 (C PH), VR5 (C W)
M.EQ	Oscilloscope

1. Adjust the **VR5** so that the pulse **width B (TP3002)** is within specification.
2. Adjust the **VR2** so that the phase **difference A** is within specification. (Trigger : TP3)

<Note>

1. If the adjustment is not completed even after the VR is fully turned, keep the VR where it is. (left end or right end)



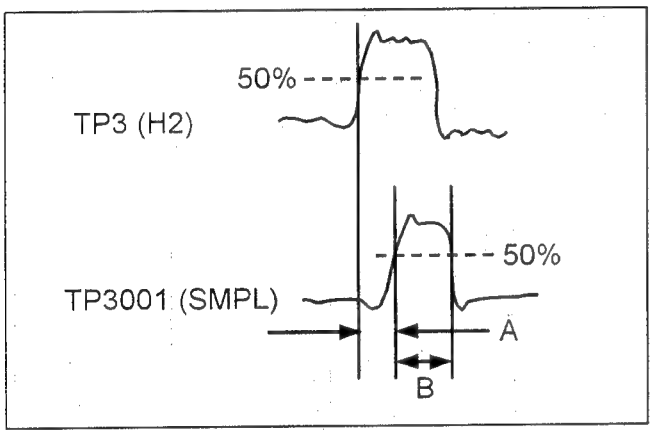
1-3. Sample Pulse Adjustment

BOARD	Pulse
SPEC.	NTSC : A = 25.0±1ns, B = 16.0±1ns PAL : A = 27.5±1ns, B = 16.0±1ns
TEST	TP3001 (SMPL) (CDS Board), TP3 (H2)
ADJUST	VR3 (S PH), VR6 (S W)
M.EQ	Oscilloscope

1. Adjust the **VR6** so that the pulse **width B (TP3001)** is within specification.
2. Adjust the **VR3** so that the phase **difference A** is within specification. (Trigger : **TP3**)

<Note>

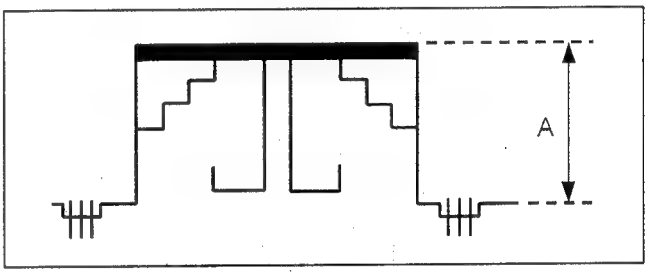
1. If the adjustment is not completed even after the VR is fully turned, keep the VR where it is. (left end or right end)



1-4. Reset DC Adjustment

BOARD	Pulse
SPEC.	A = Maximum
TEST	TP3203 (G S/H) (CDS Board)
ADJUST	VR13 (R DC), VR8 (SUB G)
F.NBR.	Open (2000LUX)
CHART	Grayscale Chart
M.EQ	Oscilloscope

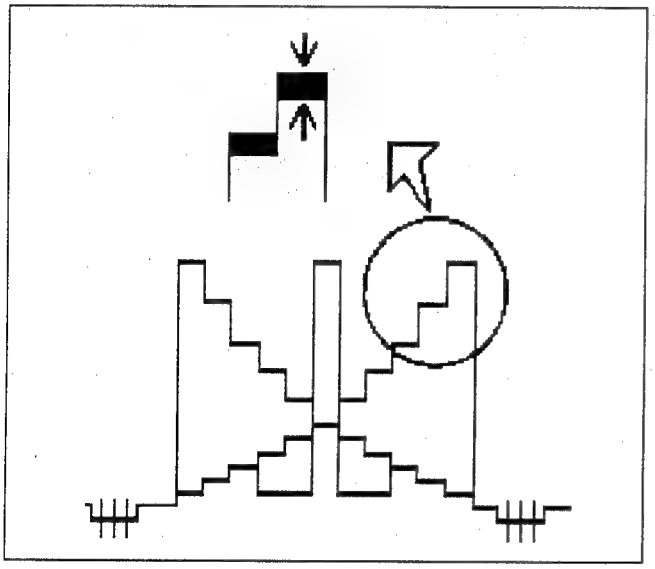
1. Set the **VR13** to the centre position.
2. Turn the **VR8** counterclockwise fully so that the saturation level depends on **R DC**.
3. Turn the **VR8** clockwise until the saturation level depends on **SUB G**.
4. Adjust the **VR13** so that the waveform level is maximized.
5. Install the Head Optical Ass'y (camera unit) again.



1-5. Carrier Leak Adjustment

BOARD	CDS
TEST	TP103 (R), TP203 (G), TP303 (B)
ADJUST	VC101 (R), VC201 (G), VC301 (B)
F.NBR.	F8 (2000LUX)
CHART	Grayscale Chart
M.EQ	Oscilloscope

1. Monitor the **TP103** and adjust the **VC101** so that the carrier leak is minimized.
2. Monitor the **TP203** and adjust the **VC201** so that the carrier leak is minimized.
3. Monitor the **TP303** and adjust the **VC301** so that the carrier leak is minimized.



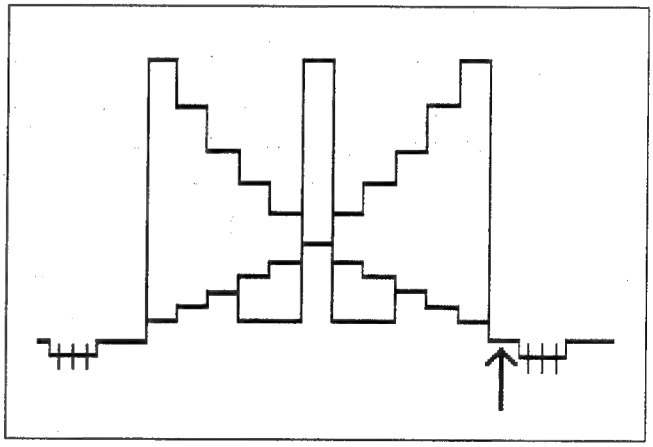
1-6. CDS OUT DC Adjustment

BOARD	CDS
SPEC.	150±50mV
TEST	TP103 (R), TP203 (G), TP303 (B)
ADJUST	VR102 (R), VR202 (G), VR302 (B)
F.NBR.	F8
CHART	Grayscale Chart
M.EQ	Oscilloscope

1. Monitor the **TP103** and adjust the **VR102** so that the black level is within specification.
2. Monitor the **TP203** and adjust the **VR202** so that the black level is within specification.
3. Monitor the **TP303** and adjust the **VR302** so that the black level is within specification.

<Note>

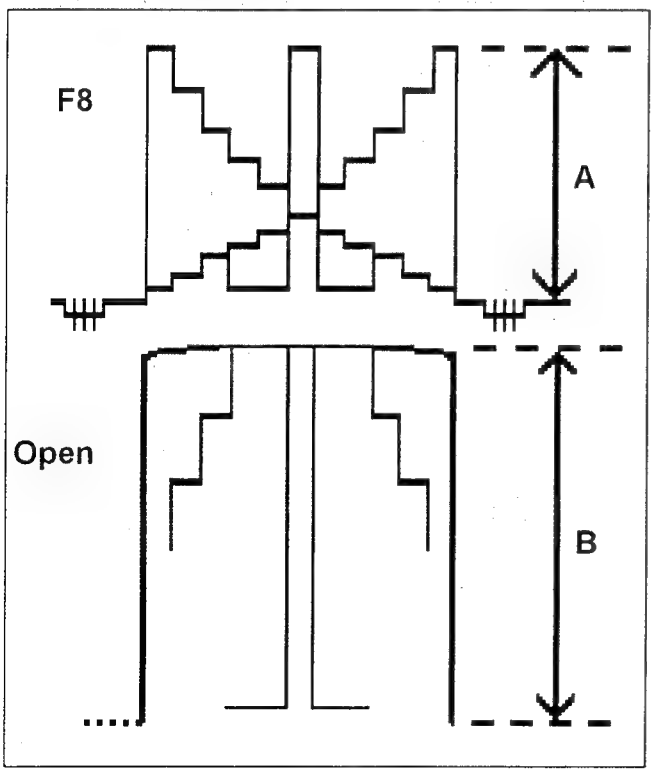
1. In case that it is difficult to recognize the black level, close the iris.
2. Monitor the center of the carrier because there is carrier on the black level.



1-7. SUB Voltage Adjustment 1

BOARD	Pulse
SPEC.	B/A = 4±0.2
TEST	TP103 (R), TP203 (G), TP303 (B), TP4 (R DC)
ADJUST	VR7 (R), VR8 (G), VR9 (B), VR13 (R DC)
F.NBR.	F8 (2000LUX), Open
CHART	Grayscale Chart
M.EQ	Oscilloscope, Digital Volt Meter

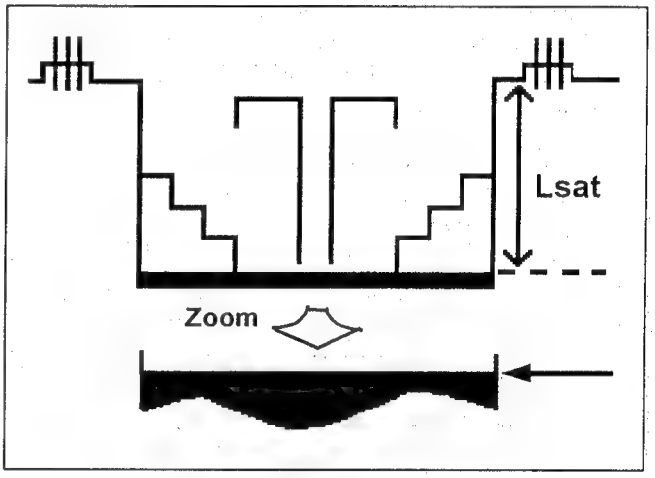
1. Monitor the **TP203 (G)** on the CDS Board and measure the **Level A** in IRIS F8.
2. Measure the **Level B** in IRIS open.
3. Adjust the **VR8 (SUB-G)** so that the **B/A ratio** is within specification.
4. Adjust the **VR13** so that the **Level B** is maximized. (Exceeding specification is no problem if the voltage at **TP4** is more than 1.7V.)
5. Repeat 1 to 4 to adjust G ch.
6. Monitor the **TP103 (R)** and adjust the **VR7 (SUB-R)** in the same way. (Do not adjust **VR13**.)
7. Monitor the **TP303 (B)** and adjust the **VR9 (SUB-B)** in the same way. (Do not adjust **VR13**.)
8. After the adjustment confirm the **"1-6. CDS OUT DC"** adjustment again.



1-8. SUB Voltage Adjustment 2

BOARD	Pulse
SPEC.	Lsat = 2600±50mV
TEST	TP2, TP202, TP402 (Pre Process)
ADJUST	VR7 (R), VR8 (G), VR9 (B)
F.NBR.	Open (2000LUX)
CHART	Grayscale Chart
M.EQ	Oscilloscope

1. Monitor the **TP2** on the Pre Process Board and adjust the **VR7** so that the voltage **Lsat** is within specification.
2. Monitor the **TP202** on the Pre Process Board and adjust the **VR8** so that the voltage **Lsat** is within specification.
3. Monitor the **TP402** on the Pre Process Board and adjust the **VR9** so that the voltage **Lsat** is within specification.



1-9. SUB Voltage Confirmation

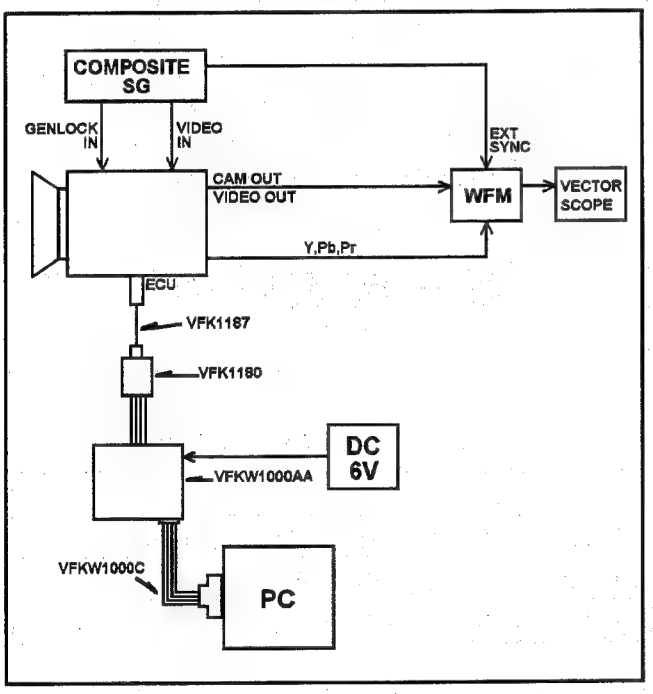
BOARD	Pulse
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR7 (R), VR8 (G), VR9 (B)
M.EQ	Color Monitor TV, 500W Halogen Lamp

1. Shoot the halogen lamp so that it is one tenth as large as the size of monitor.
2. Confirm that the blooming part has no color.
3. If that part has some color, execute **"1-7. SUB Voltage Adjustment 1"** and **"1-8. SUB Voltage Adjustment 2"**.

2. Video Main and DSP

2-1. Initial Setting

1. Set the Camera Recorder as follows:
   AUTO W/B BAL : OFF
   SHUTTER : OFF
   GAIN : L
   OUTPUT : BAR
   WHITE BAL : PRE
2. Turn the power switches of the camera recorder and the EVR **OFF**.
2. Connect the EVR with ECU connector as shown in figure.
3. Turn the power of EVR **ON** and then Camera Recorder **ON**.
4. Pressing [SHIFT], [+] and [-] buttons in operation panel, set the MENU SW to SET.
5. Press the PAGE button to open the SERVICE ADJ. menu. Select EVR in ECU CONNECT.
6. After setting turn the MENU **OFF**.
7. Execute the CAM_TOOL. EXE to start EVR program. (Refer to **Setup of EVR Tool**.)



2-2. D3.0V Adjustment

BOARD	Video Main
SPEC.	3.15V+0.05V / -0.00V
TEST	TP9
ADJUST	VR5 (Power)
MODE	REC
M.EQ	Digital Volt Meter

1. Adjust the **VR5** on Power board so that the voltage at the **TP9** is within specification.

2-3. Ref DC for A/D Adjustment

BOARD	DSP
SPEC.	2.0±0.001V
TEST	TP6
ADJUST	VR1
M.EQ	Digital Volt Meter

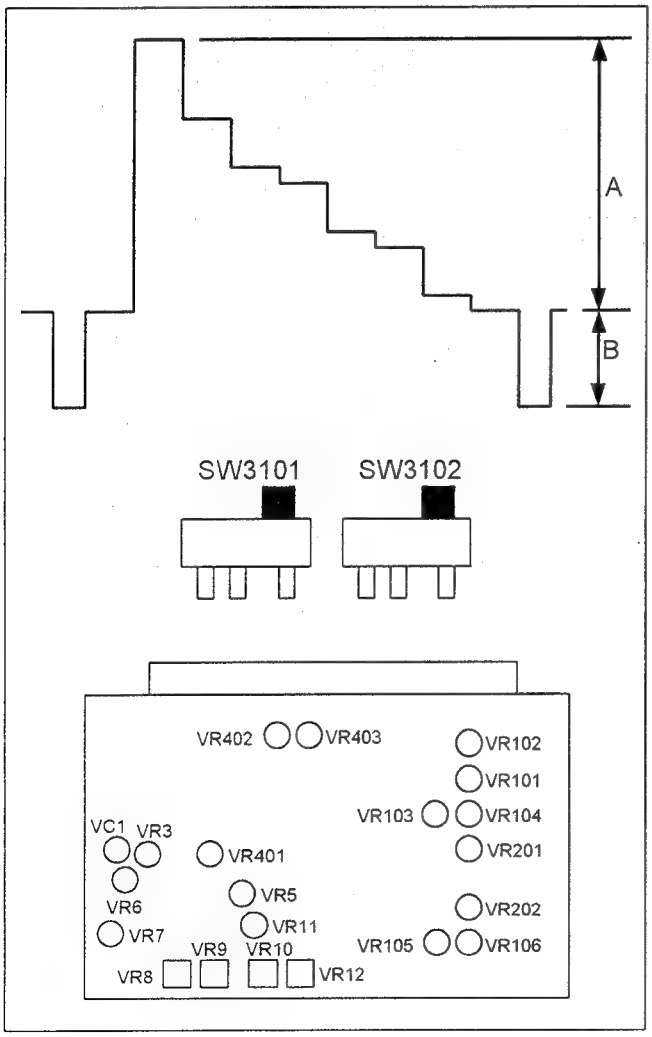
1. Confirm that the DC voltage at **TP6** is within specification, and adjust the **VR1** in case of need.

3. Encoder

3-1. Y & SYNC Levels Adjustment 1

BOARD	Encoder
SPEC.	A = 700±14mV, B = 300±6mV
TEST	TP104
ADJUST	VR101, VR102, SW101, SW102
MODE	Camera Bar
M.EQ	Oscilloscope, Waveform Monitor

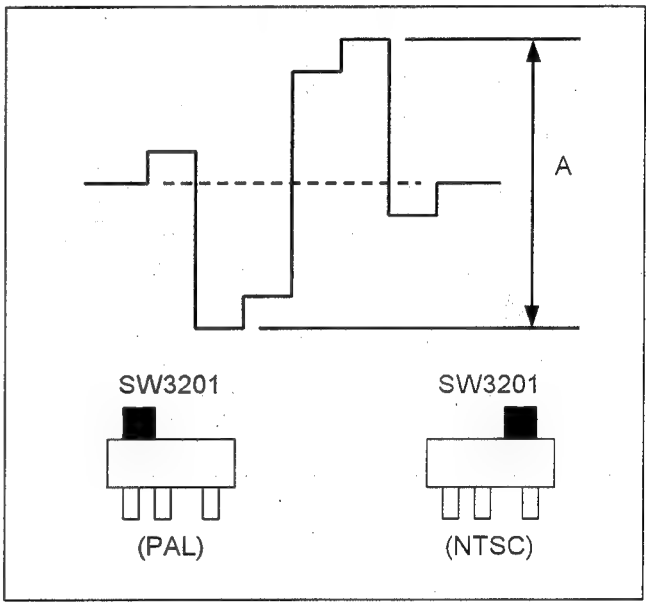
1. Confirm that the **SW101** and **SW102** are turned **ON** as shown in figure.
2. Monitor the **TP104** and adjust the **VR102** so that the **Level A** is within specification.
3. Adjust the **VR101** so that the **Level B** is within specification.



3-2. Pr Level Adjustment

BOARD	Encoder
SPEC.	NTSC : A = 700±14mV PAL : A = 525±10mV
TEST	TP203
ADJUST	VR201, SW201
MODE	Camera Bar
M.EQ	Oscilloscope, Waveform Monitor

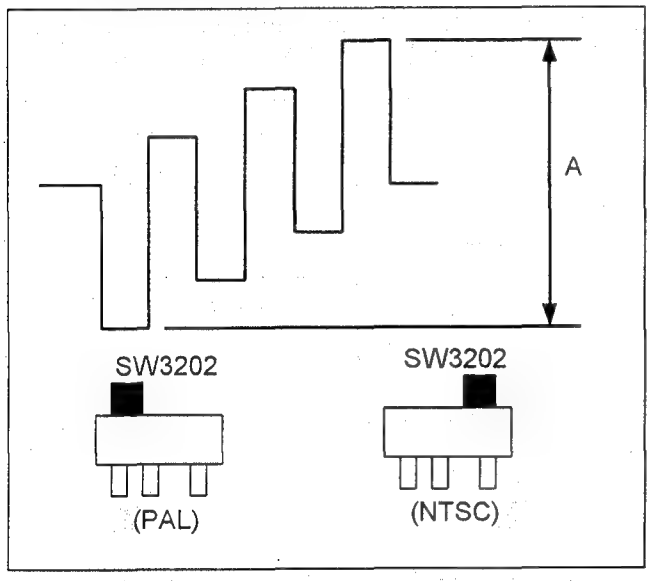
1. Set the **SW201** as shown in figure and adjust the **VR201** so that the **Level A** is within specification.



3-3. Pb Level Adjustment

BOARD	Encoder
SPEC.	NTSC : A = 700±14mV PAL : A = 525±10mV
TEST	TP204
ADJUST	VR202, SW202
MODE	Camera Bar
M.EQ	Oscilloscope, Waveform Monitor

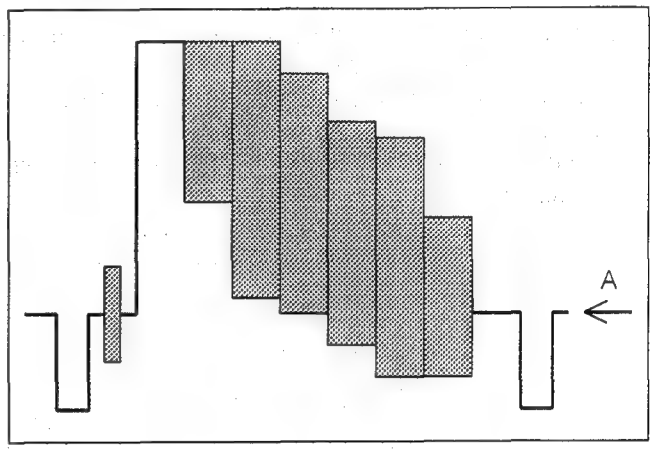
1. Set the **SW202** as shown in figure and adjust the **VR202** so that the **Level A** is within specification.



3-4. CAM DC Adjustment

BOARD	Encoder
SPEC.	A = 0±10mV
TEST	CAM OUT (75Ω terminated)
ADJUST	VR11
MODE	Camera Bar
M.EQ	Oscilloscope, Waveform Monitor

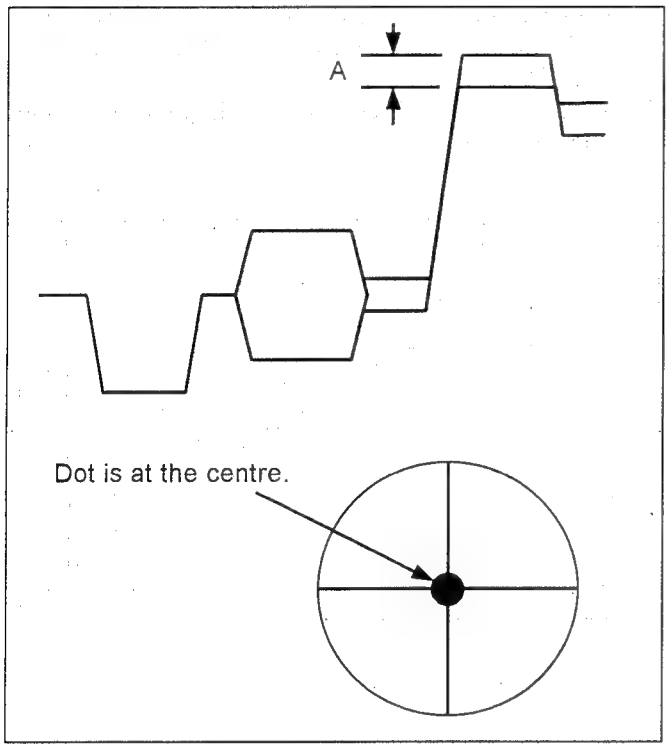
1. Adjust the **VR11** so that the **DC voltage** is within specification.



3-5. Carrier Balance Adjustment

BOARD	Encoder
SPEC.	A = Minimum, Dot at the centre
TEST	CAM OUT (75Ω terminated)
ADJUST	VR8, VR9
MODE	Camera Bar
M.EQ	Waveform Monitor, Vector Scope

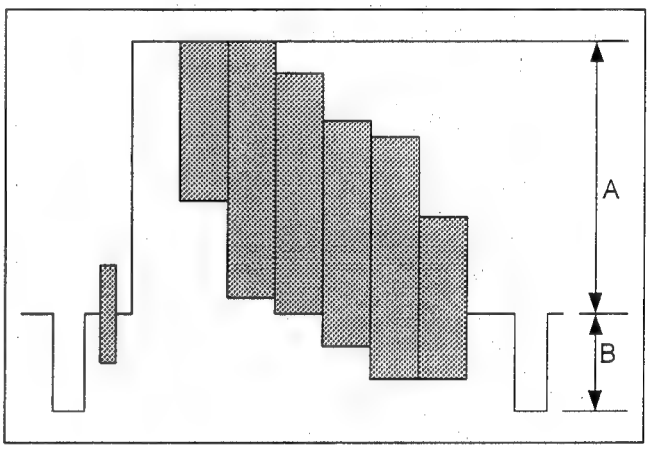
1. Adjust the **VR8** so that the **width A** is minimized.
2. Adjust the **VR9** as well as **VR8**.
3. Repeat the above steps until the **width A** is minimized.



3-6. Y & SYNC Levels Adjustment

BOARD	Encoder
SPEC.	NTSC : A = 714±15mV, B = 286±6mV PAL : A = 700±14mV, B = 300±6mV
TEST	CAM OUT (75Ω terminated)
ADJUST	VR12, VR105, VR106
MODE	Camera Bar
M.EQ	Oscilloscope, Waveform Monitor

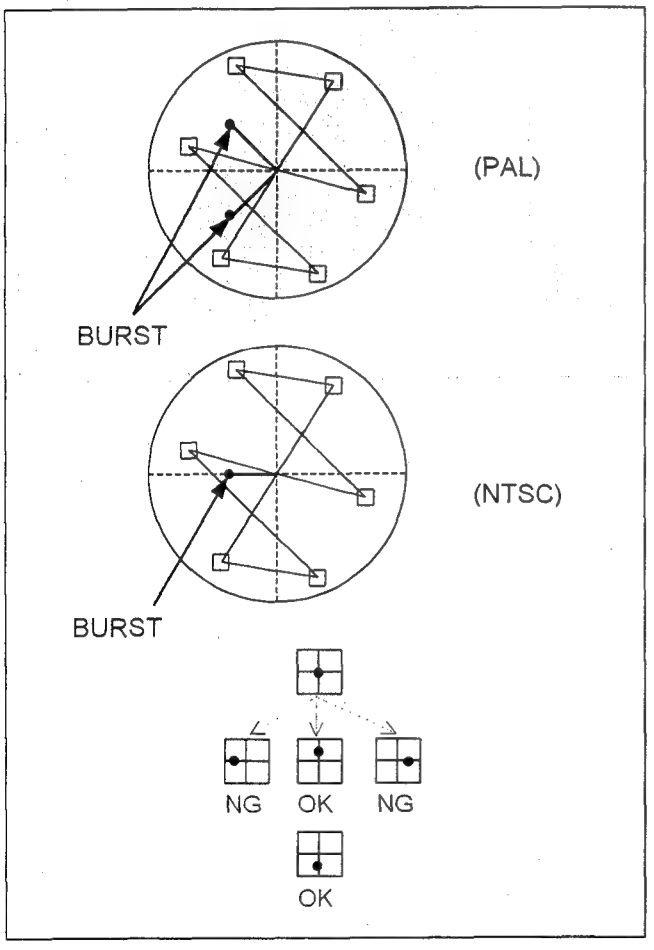
1. Set the **VR12** to centre position.
2. Adjust the **VR106** so that the **level A** is within specification.
3. Adjust the **VR105** so that the **level B** is within specification.



3-7. Burst Level & Vector Adjustment

BOARD	Encoder
TEST	CAM OUT (75Ω terminated)
ADJUST	VC1, VR3, VR5, VR6, VR7 (PAL), VR10 (NTSC)
MODE	Camera Bar
M.EQ	Vector Scope

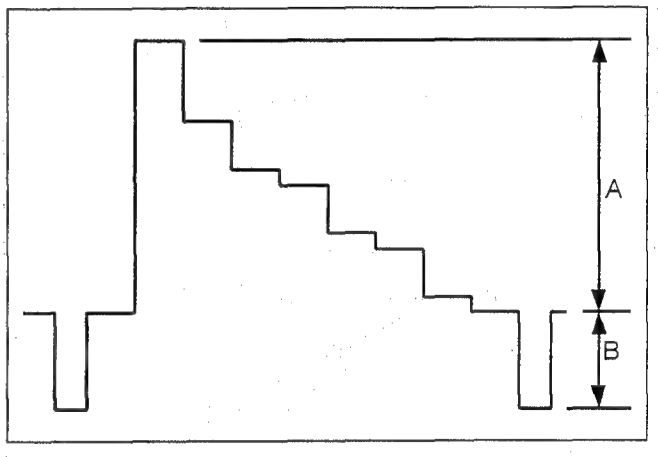
1. Set the **VR7 (for PAL)** or **VR10 (for NTSC)** to centre position.
2. Adjust the **VC1** so that both burst levels are the same.
3. Adjust the **VR6** and **VR7 (for PAL)** or **VR10 (for NTSC)** so that both bursts are fixed on scales.
4. Adjust the **VR3, VR5** and **VC1** so that all colour phase are fixed on scales



3-8. Video Out & Sync Adjustment

BOARD	Encoder
SPEC.	NTSC : A = 714±15mV, B = 286±6mV PAL : A = 700±14mV, B = 300±6mV
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR104, VR103
MODE	Camera Bar
M.EQ	Oscilloscope, Waveform Monitor, EVR

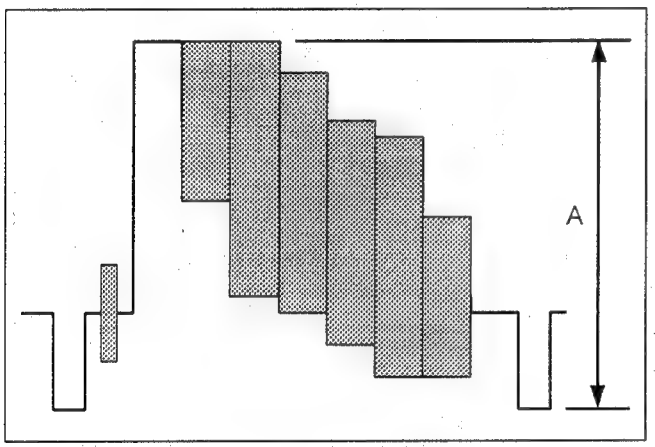
1. Press the [F2] and [0] in EVR and confirm that the EVR display indicates [1E][02][00].
2. (Video out : Y out)
3. Connect the Waveform Monitor with VIDEO OUT and adjust the **VR104** so that the **level A** is within specification.
4. Adjust the **VR103** so that the **level B** is within specification.



3-9. Return Video Level Adjustment

BOARD	Encoder
SPEC.	A = 1.0V±20mV
TEST	VIDEO OUT
ADJUST	VR403
MODE	Video In : Colour Bar
M.EQ	Oscilloscope, Waveform Monitor, EVR, Signal Generator

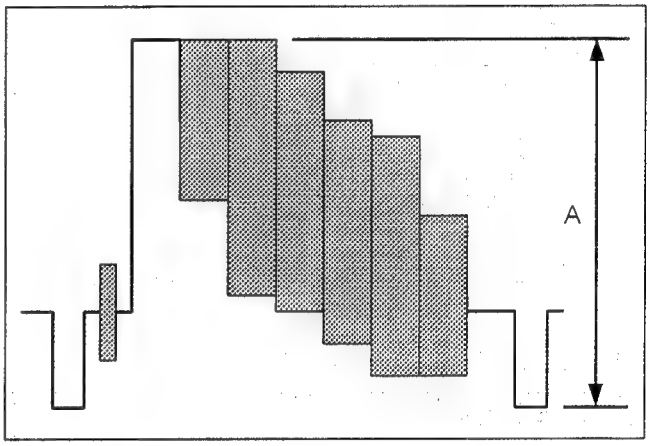
1. Mounting the VIDEO IN connector (Accessory). See operating instruction page 17.
2. Input the colour bar signal to VIDEO IN connector.
3. Confirm that the EVR display indicates [1E][02][00] and then press the [→] to set the EVR to [1E][03][00]. Otherwise press the [CMD][1E] [DATA][03] [ADR][00] [SET] to input [1E][03][00].
4. Connect the Waveform Monitor with VIDEO OUT and adjust the **VR403** so that the **level A** is within specification.



3-10. Mon Enc Level Adjustment

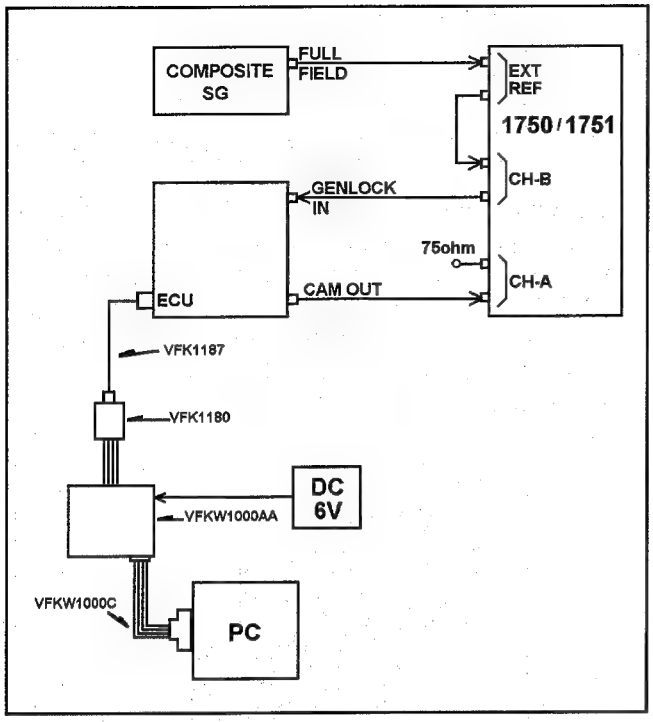
BOARD	Encoder
SPEC.	A = 1.0V±20mV
TEST	VIDEO OUT
ADJUST	VR401
MODE	Camera Bar
M.EQ	Oscilloscope, Waveform Monitor, EVR

1. Confirm that the EVR display indicates [1E][03][00] and then press the [→] to set the EVR to [1E][04][00]. Otherwise press the [CMD][1E] [DATA][04] [ADR][00] [SET] to input [1E][04][00].
2. Connect the Waveform Monitor with VIDEO OUT and adjust the **VR401** so that the **level A** is within specification.



4. Sync

4-1. Connection



4-2. 4fsc VCO Adjustment

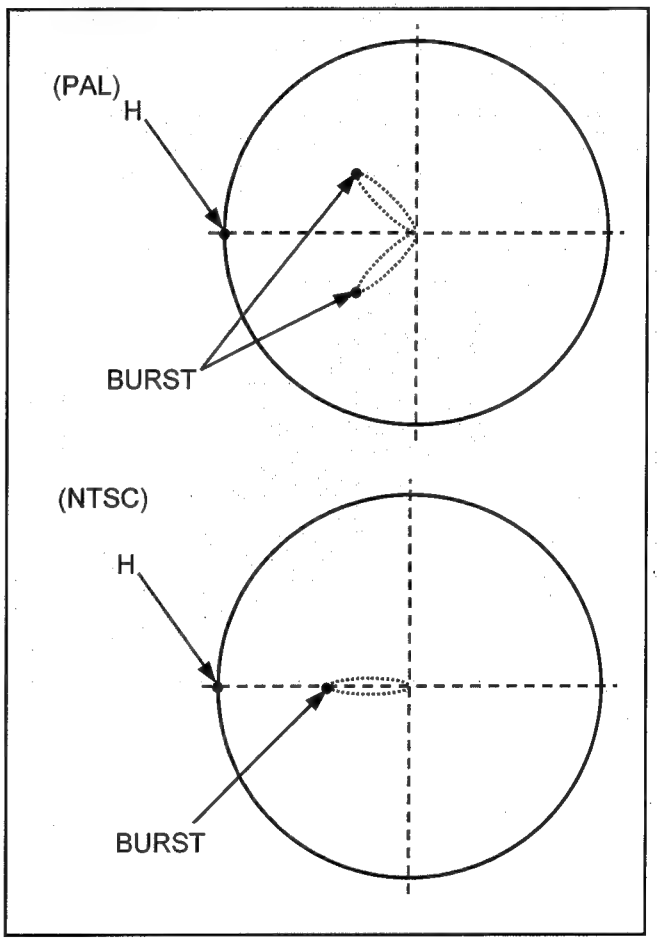
BOARD	Sync
SPEC.	14.31818MHz±10Hz (NTSC) 17.734475MHz±10Hz (PAL)
TEST	TP3101
ADJUST	VR3104
MODE	Camera Bar
M.EQ	Oscilloscope, Frequency Counter

1. Disconnect GEN LOCK IN and adjust the **VR3104**so that the frequency at **TP3101** is within specification.

4-3. SCH Phase Adjustment

BOARD	Sync
SPEC.	0±2°
TEST	CAM OUT (75 Ω Terminated)
ADJUST	VR3102
MODE	Camera Bar
M.EQ	SCH Meter

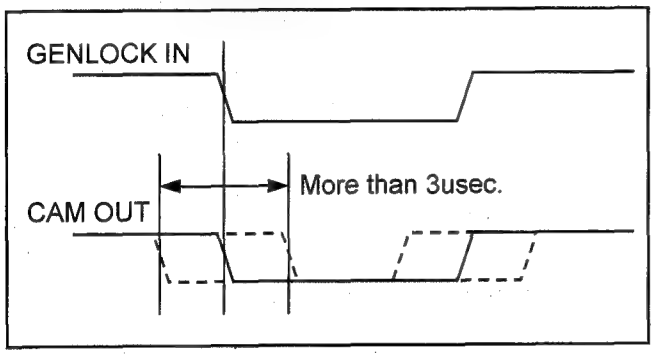
1. Disconnect GEN LOCK IN and set the SCH Meter to INT mode.
2. Adjust the **VR3102** so that the SCH is within specification.



4-4. System Phase Adjustment 1

BOARD	Sync
TEST	CAM OUT (75 Ω Terminated)
ADJUST	VR3103
INPUT	Composite (RS-170A)
MODE	Camera Bar
M.EQ	Waveform Monitor, EVR

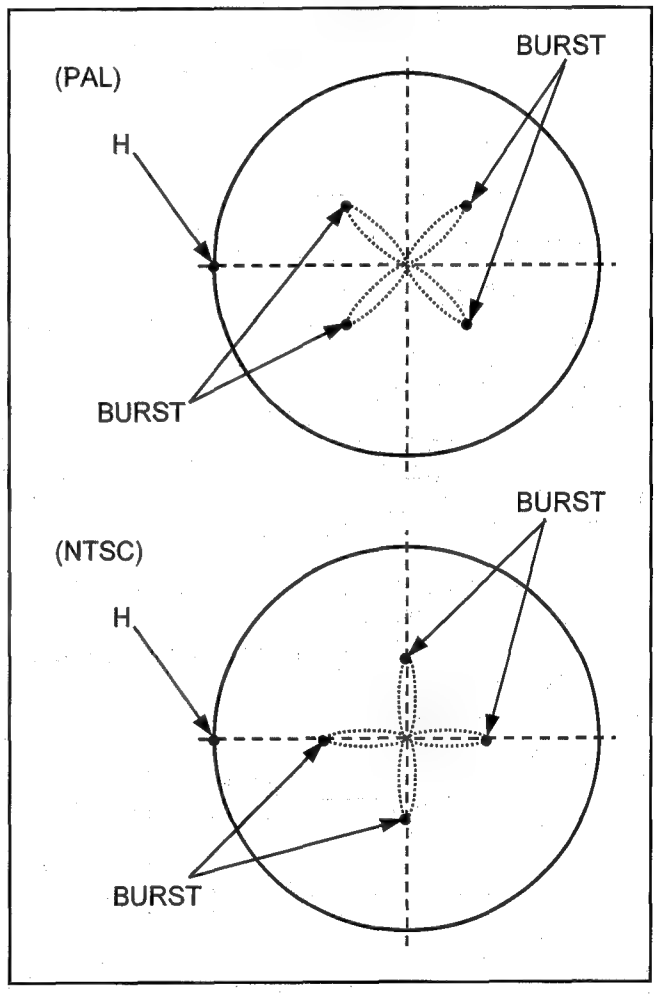
1. Set the waveform Monitor to EXT mode.
2. Set the EVR to [1E][14][00].
3. Confirm that the composite signal is input to GEN LOCK IN.
4. Adjust the **VR3103** so that CAM OUT and GEN LOCK IN are the same in sync phase.



4-5. System Phase Adjustment 2

BOARD	Sync
TEST	CAM OUT
ADJUST	VR3103, VR3001
INPUT	Composite (RS-170A)
MODE	Camera Bar
M.EQ	SCH Meter, EVR

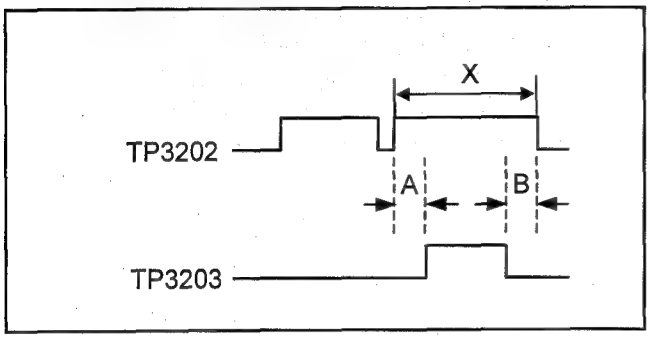
1. Set the SCH Meter to EXT mode.
2. Adjust the **VR3103** slightly so that CAM OUT and GEN LOCK IN are the same in H phase.
3. Set the EVR to [1E][1C][00].
4. Adjust the **VR3001** slightly so that CAM OUT and GEN LOCK IN are the same in BURST phase.



4-6. REF SCH Adjustment (for PAL only)

BOARD	Sync
SPEC.	A = B±10%
TEST	TP3202, 3203
ADJUST	VR3101
M.EQ	Oscilloscope

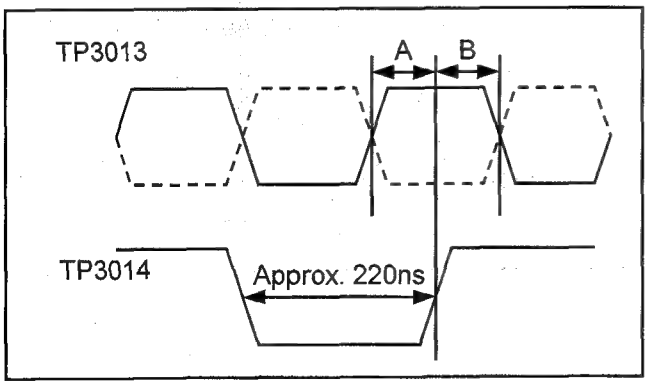
1. Adjust **VR3101** so that the High portion of TP3203 is centered at X portion of TP3202.



4-7. REF SCH Adjustment (for NTSC only)

BOARD	Sync
SPEC.	A = B±10%
TEST	TP3013, 3014
ADJUST	VR3002
M.EQ	Oscilloscope

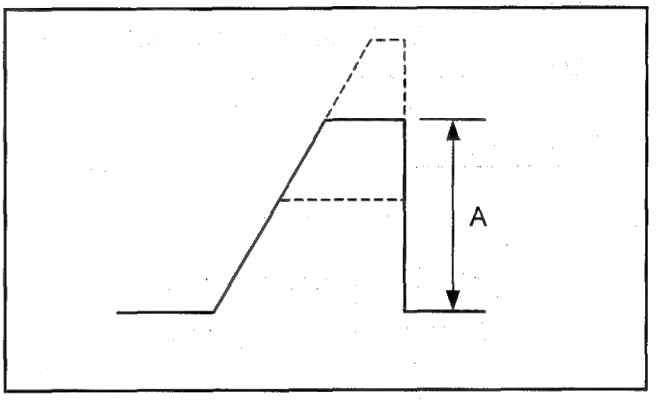
1. If it is impossible to make **"4-3. SCH Phase Adjustment"**, try this item.
2. Adjust the **VR3002** so that the **A** and **B** are within specification.



4-8. Test Signal Level Adjustment

BOARD	SYNC
SPEC.	A = 1.9±0.1V
TEST	TP3501
ADJUST	VR3504
MODE	Test Signal
M.EQ	Oscilloscope, EVR

1. Set the EVR to [1E][22][00].
2. Monitor the **TP3501** and adjust the **VR3504** so that the **level A** is within specification.



5. Head Optical Ass'y 2

5-1. AWB Preset Level Adjustment

BOARD	CAM SYSCON
SPEC.	2.0±0.01V
TEST	TP3514 (AWB R), TP3515 (AWB B) TG3500 (GND)
ADJUST	EVR
MODE	------
M.EQ	Digital Volt Meter, EVR

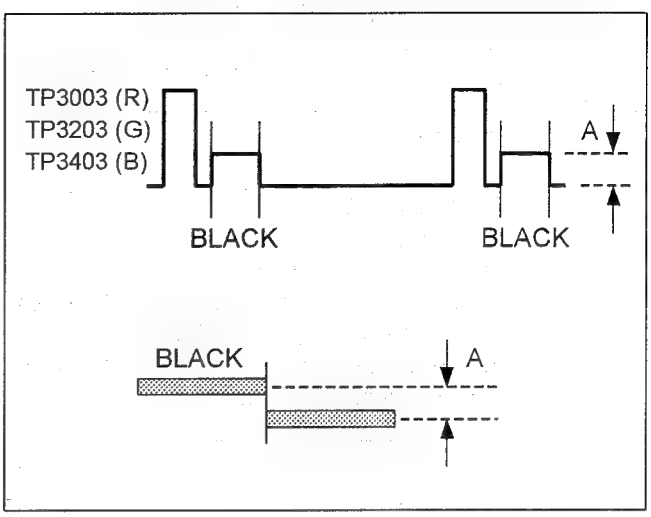
1. Set the AWB SW to "PRESET" mode.
2. Connect the DVM to **TP3514 (AWB R)** and **TG3500 (GND)**.
3. Set the EVR to [0E][66][61]. And press the [→] or [←] key in EVR so that the **DC voltage** is within specification.
4. Connect the DVM to **TP3515 (AWB B)** and **TG3500 (GND)**.
5. Set the EVR to [0E][66][62], and press the [→] or [←] key in EVR so that the **DC voltage** is within specification.
6. Turn the power switch to **OFF**.

5-2. RGB Pedestal Adjustment

BOARD	Pre Process
SPEC.	A = 0±50mV
TEST	TP3 (R), TP203 (G), TP403 (B)
ADJUST	VR1 (R), VR201 (G), VR401 (B)
F.NBR.	Close
M.EQ	Oscilloscope, EVR

1. Press the [F2] and [2] keys in EVR or input [1E][20][00].
   (Set the "PED R, G, B" signal to ; 2.0VDC)
2. Monitor the **TP3** and adjust the **VR1 (R PED)** so that the **blanking level** is flat.
3. Monitor the **TP203** and adjust the **VR201 (G PED)** so that the **blanking level** is flat.
4. Monitor the **TP403** and adjust the **VR401 (B PED)** so that the **blanking level** is flat.

<Note>
Monitor the centre of the carrier because there is carrier on the **Black Level** And **Pedestal Level**.



5-3. 0% ABB Adjustment

BOARD	Pre Process
SPEC.	------
TEST	------
ADJUST	EVR
MODE	------
M.EQ	EVR

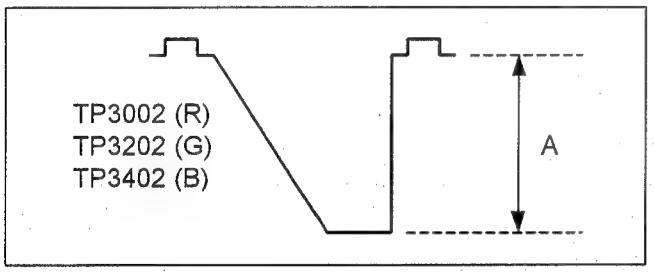
<Note>
From next **"5-4. Test Signal Level Adjustment"** are necessary this **0% ABB setting**. If perform the adjustment individually, this **0% ABB setting** must be done before adjustment.

1. Set the EVR to [1E][21][00].
2. Execute the ABB by front switch.

5-4. RGB Test Signal Level Adjustment

BOARD	Pre Process
SPEC.	A = 666±10mV
TEST	TP2 (R), TP202 (G), TP402 (B)
ADJUST	VR3015 (R), VR3013 (G), VR3014 (B) (Sync board)
MODE	Test Signal
M.EQ	Oscilloscope, EVR

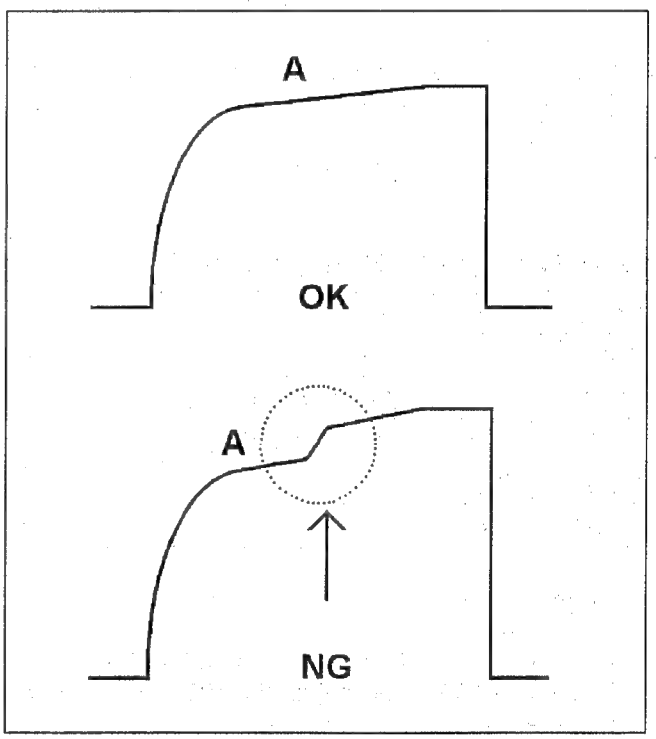
1. Set the EVR to [1E][22][00].
2. Monitor the **TP2** and adjust the **VR3015 (R)** so that the **level A** is within specification.
3. Monitor the **TP202** and adjust the **VR3013 (G)** so that the **level A** is within specification.
4. Monitor the **TP402** and adjust the **VR3014 (B)** so that the **level A** is within specification.



5-5. RGB A/D Input Level Adjustment 1

BOARD	Pre Process
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR2 (R), VR202 (G), VR402 (B)
MODE	Test Signal
M.EQ	Waveform Monitor, EVR

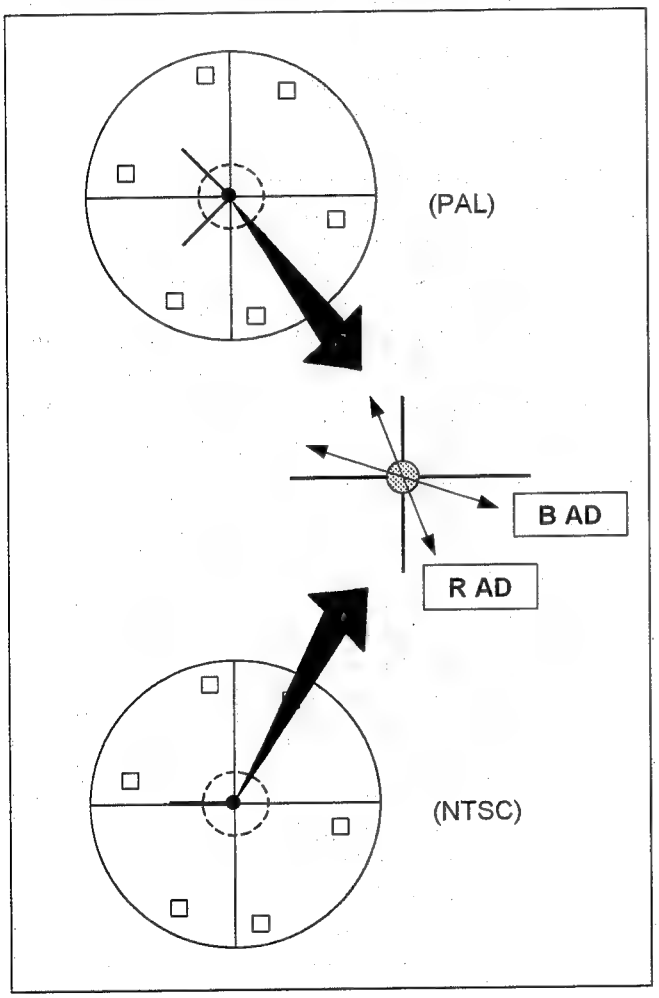
1. Set the EVR to [1E][23][00]. (**R ch** is selected.)
2. Adjust the **VR2** to increase the A/D level And then stop adjusting just before the **A portion** is uneven.
3. Set the EVR to [1E][24][00]. (**G ch** is selected.)
4. Adjust the **VR202** to increase the A/D level And then stop adjusting just before the **A portion** is uneven.
5. Set the EVR to [1E][25][00]. (**B ch** is selected.)
6. Adjust the **VR402** to increase the A/D level And then stop adjusting just before the **A portion** is uneven.



5-6. RGB A/D Input Level Adjustment 2

BOARD	Pre Process
TEST	CAM OUT (75Ω terminated)
ADJUST	VR2 (R), VR402 (B)
MODE	Test Signal
M.EQ	Vector Scope

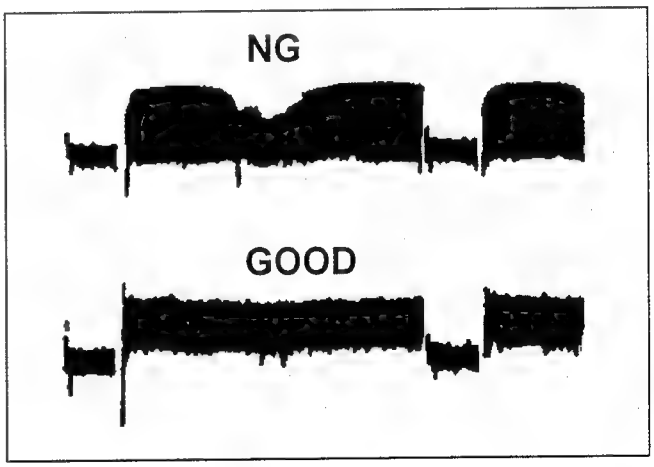
1. Set the Test saw on the Service ADJ menu to **ON**.
2. Set the GAIN to +9dB and Auto Knee to **OFF**.
3. Set the Vector Scope Gain to MAX.
4. Fine-adjust the **VR2** and **VR402** so that the dot is at the center of the vector scope.



5-7. Shading Balance Adjustment

BOARD	Pre Process
SPEC.	Flat
TEST	TP3 [R], TP203 [G], TP403 [B]
ADJUST	VR4 [R BAL] , VR204 [G BAL], VR304 [B BAL]
F.NBR.	F8+1/3(2000LUX), Optical Filter:1
CHART	Grayscale Chart(3200 ° K)
M.EQ	Oscilloscope, Lux Meter, Color Pyrometer

1. Shoot the Grayscale chart.
2. Perform the Digital White shading.
   1) Set the EVR to [1E][30][00]. (GAIN = 0dB, Knee = OFF)
   2) Set the EVR to [1E][31][00] (Start the Digital White Shading collection) (While executing, '＊' or 'ACTIVE' is displayed on EVF.)
3. Close the IRIS.
4. Monitor the **TP3** and adjust **VR4** so that the carrier is minimized as shown in figure.
5. Monitor the **TP203** and adjust **VR204** so that the carrier is minimized as shown in figure.
6. Monitor the **TP403** and adjust **VR304** so that the carrier is minimized as shown in figure.
7. Perform the Digital White Shading again with no shading white chart. (See 5-13 Digital White Shading)



5-8. RGB Pedestal Tracking Adjustment

BOARD	Pre Process
TEST	CAM OUT (75Ω terminated)
ADJUST	VR3 (R), VR403 (B)
F.NBR.	Close
M.EQ	Vector Scope, EVR

1. Pressing [SHIFT], [→] and [←] buttons in operation panel, turn the MENU SW **on**.
2. Press the PAGE button to open the following menus and remember the number. And then set to **zero**.
   LEVEL 4/6 : R, G, B FLARE
   : R, B GAMMA
   SERVICE ADJ. : R, B GAMMA
3. Set the EVR to [1E][28][00]. (Master PED = MAX)
4. Set the Vector Scope to Gain : MAX.
5. Adjust the **VR3** and **VR403** so that the dot is at the center of the vector scope.
6. Press [→] key to set to [1E][29][00]. (Master PED = minimum) Confirm that the dot is still at the center of the vector scope.
7. If not, repeat 3, 5 and 6.
8. After adjustment, the data of following menus set to original number.
   LEVEL 4/6 : R, G, B FLARE
   : R, B GAMMA
   SERVICE ADJ. : R, B GAMMA

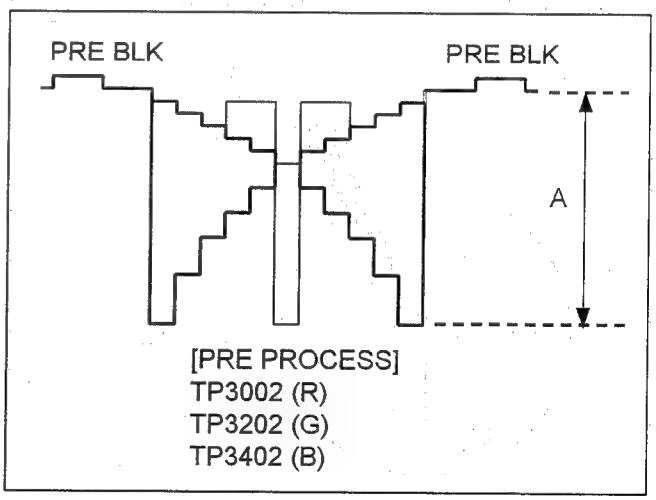
<Note>

1. Adjust the **VR3** to move **vertically** and the **VR403** **horizontally**.

5-9. RGB Sample & Hold Level Adjustment 1

BOARD	Pre Process
SPEC.	A = 666±10mV
TEST	TP2 (R), TP202 (G), TP402 (B)
ADJUST	VR101 (R), VR201 (G), VR301 (B) (CDS Board)
F.NBR.	F8+1/3 (2000LUX), Optical Filter : 1
CHART	Grayscale Chart (3200 ° K)
M.EQ	Oscilloscope, Lux Meter, Color Pyrometer

1. Set as follows :
   CAM/BAR : CAM ON
   AWB : NEUTRAL
   GAIN : L
2. Don't use an extender of lens.
3. Set the EVR to [1E][27][00].
   (GAIN = 0dB, Knee = OFF, TEST SIG = OFF)
4. Monitor the **TP2** and adjust the **VR101 (R LVL)** so that the **level A** is within specification.
5. Monitor the **TP202** and adjust the **VR201 (G LVL)** so that the **level A** is within specification.
6. Monitor the **TP402** and adjust the **VR301 (B LVL)** so that the **level A** is within specification.



5-10. Vertical Pattern Noise Confirmation & Adjustment

BOARD	Pulse
TEST	CAM OUT (75Ω terminated)
ADJUST	VR3
F.NBR.	Close
M.EQ	Monitor TV, EVR

1. Set the EVR to [1E][36][00] (GAIN = +18dB, Pedestal = 30%).
2. Execute the **ABB** function.
3. Confirm that there is no fixed pattern noise vertically with lens closed.
4. If there is, set the EVR to [1E][37][00], (GAIN = +18dB, Pedestal = 30%, Detail = OFF, 2DLPF = ON, Masking = OFF) and then adjust the **VR3**, remember the original position of **VR3**, so that the noise is minimized. (If the noise is not decreased, set **VR3** to the original position again.)

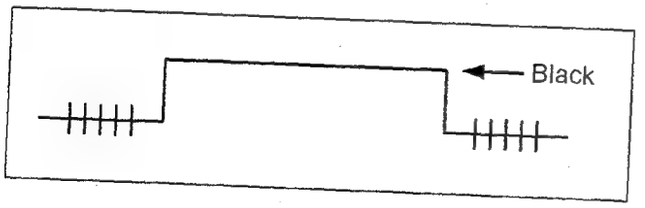
5-11. CDS DC Adjustment

BOARD	CDS
SPEC.	150±50mV
TEST	TP103 (R), TP203 (G), TP303 (B)
ADJUST	VR102 (R), VR202 (G), VR302 (B)
F.NBR.	Close
M.EQ	Oscilloscope

1. Monitor the **TP103** and adjust the **VR102** so that the black level is within specification.
2. Monitor the **TP203** and adjust the **VR202** so that the black level is within specification.
3. Monitor the **TP303** and adjust the **VR302** so that the black level is within specification.

<Note>

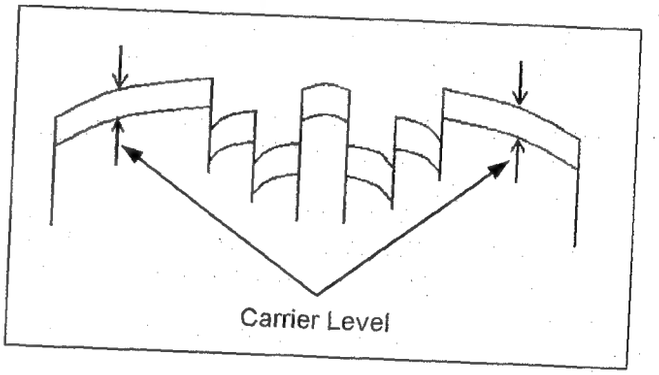
1. Monitor the center of the carrier because there is carrier on the black level.



5-12. High-Light Carrier Level Adjustment

BOARD	Pulse
TEST	CAM OUT (75Ω terminated)
ADJUST	VR7 (SUB R), VR9 (SUB B)
CHART	Grayscale Chart
M.EQ	Waveform Monitor, EVR

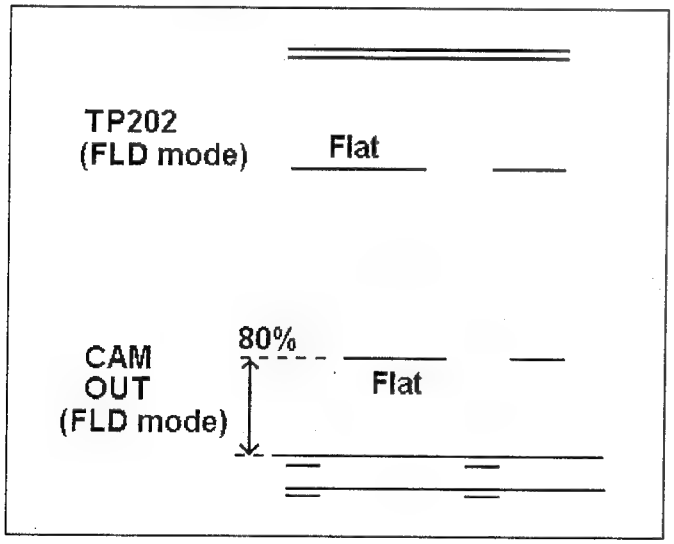
1. Set the EVR to [1E][3A][00].
2. Select PRESET position in **AWB mode**.
3. Execute the **ABB** function.
4. Open the iris until upper three steps are saturated in grayscale waveform as shown in figure.
5. Adjust the **VR7** and **VR9** alternately so that the **carrier level** is minimized. (less than 6IRE)
6. After the adjustment, confirm the **"5-11. CDS DC Adjustment"**.



5-13. Analog White Shading Adjustment

BOARD	Pre Process
TEST	CAM OUT (75Ω terminated), TP202
ADJUST	EVR
M.EQ	Waveform Monitor, Vector Scope, EVR, Lens (Built-in Extender) Light Box (Spherical Type)

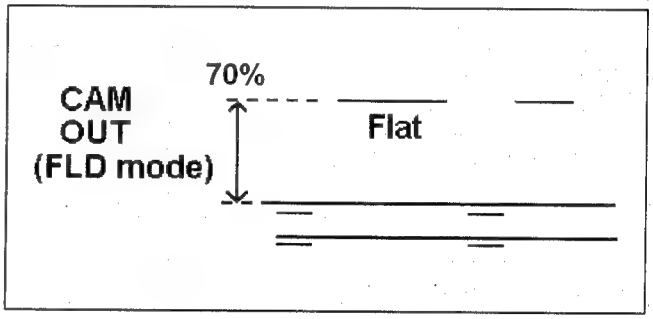
1. Set the EVR to [1E][2E][00].
2. Open the iris until the peak level is 80% in CAM OUT **without extender**.
3. Select **A position** in **AWB mode** and execute the AWB function.
4. Execute the **ABB** function.
5. Adjust the iris to 80% again until the peak level is 80% and execute the **AWB** function.
6. Set the EVR to [0E][80][0E].
7. Monitor the **TP202** in waveform monitor (field mode) and press [→] or [←] key in EVR so that the waveform is flat.
8. Input [1E][2F][00] in EVR to execute the analog white shading. (While executing, '＊' or **'ACTIVE'** is displayed on EVF.)
9. Execute the **AWB** function.
10. Monitor the **TP202** in vector scope and confirm that the dot is round and around the center of the scope.
11. Open the iris until the peak level is 80% in CAM OUT **with extender**.
12. Execute the **AWB** function and repeat 6 to 10.



5-14. Digital White Shading Adjustment

TEST	CAM OUT (75Ω terminated)
ADJUST	EVR
M.EQ	Waveform Monitor, Vector Scope, EVR, Lens (Built-in Extender) Light Box (Spherical Type)

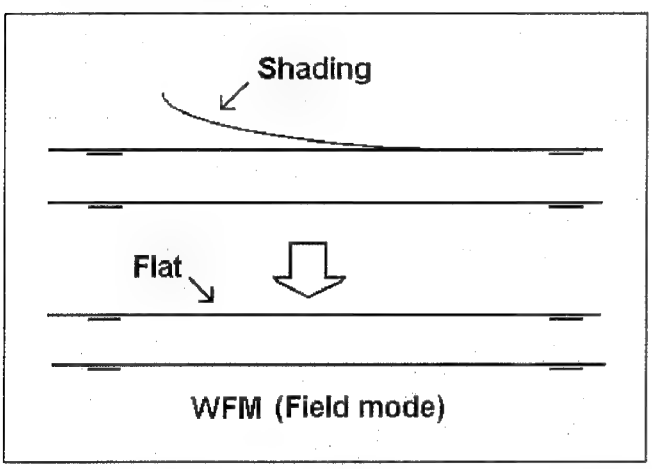
1. Set the EVR to [1E][30][00].
2. Open the iris until the peak level is 70% in CAM OUT **without extender**.
3. Select **A position** in AWB mode and execute the AWB function.
4. Input [1E][31][00] in EVR to execute the digital white shading. (While executing, '＊' or **'ACTIVE'** is displayed on EVF.)
5. Execute the AWB function.
6. Monitor the CAM OUT in waveform monitor (field mode) and confirm that the waveform is flat.
7. Monitor the CAM OUT in vector scope and confirm that the dot is round and around the center of the scope.



5-15. Auto Dark Shading Adjustment

TEST	CAM OUT (75Ω terminated)
ADJUST	EVR
F.NBR.	Close
M.EQ	Waveform Monitor, EVR

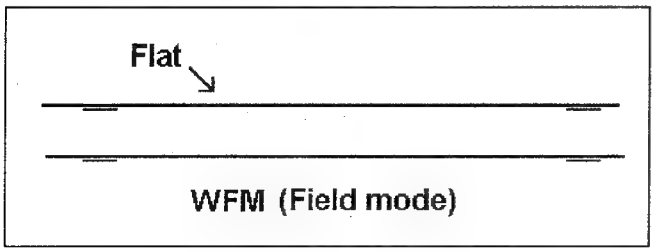
1. Set the AWB position to PRE.
2. Execute the ABB function.
3. Input [1E][2A][00] in EVR to confirm executing the auto dark shading.
4. Monitor the CAM OUT in waveform monitor (field mode) and confirm that the waveform is made flat.
5. Confirm that the shading is completed and waveform is flat.



5-16. Digital Dark Shading Adjustment

TEST	CAM OUT (75Ω terminated)
ADJUST	EVR
F.NBR.	Close
M.EQ	Waveform Monitor, EVR

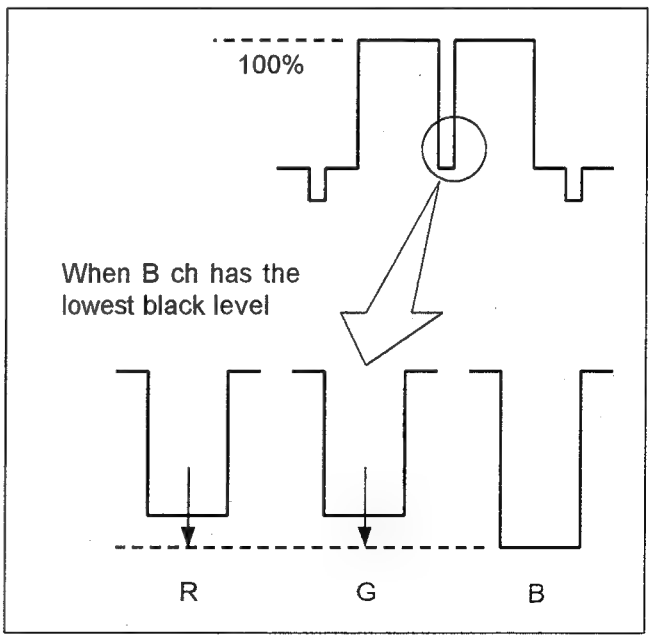
1. Set AWB position to PRE.
2. Input [1E][2B][00] in EVR.
3. Input [1E][2D][00] in EVR to execute the digital dark shading. (While executing, '∗' or **'ACTIVE'** is displayed on EVF.)
4. Monitor the CAM OUT in waveform (field mode) monitor and confirm that the waveform is flat.



5-17. Flare Correction Adjustment

TEST	VIDEO OUT (75Ω terminated)
ADJUST	EVR
F.NBR.	(2000LUX)
CHART	Flare chart
M.EQ	Waveform Monitor, S/N Meter, EVR

1. Set the EVR to [1E][27][00].
2. Open the iris until white level is 80%.
3. Execute AWB function in the A ch and then ABB function.
4. Adjust the iris again and execute AWB function in the A ch.
5. Open the iris until white level is 100%.
6. Open the iris 1.5 steps more, for example, F8 to F5.6-1/2.
7. Input [1E][32][00] in EVR to select R ch and measure the black level.
8. Input [1E][33][00] in EVR to select G ch and measure the black level.
9. Input [1E][34][00] in EVR to select B ch and measure the black level.
10. Don't adjust the channel which has the lowest black level.
11. Adjust the black levels of other two channels to the level of the channel mentioned above No.9 with EVR. The ways to change the black levels are as shown below.
    (R ch) After inputting [1E][32][[00] and then [0E][00][0B], press [→] or [←] key.
    (G ch) After inputting [1E][33][[00] and then [0E][00][0C], press [→] or [←] key.
    (B ch) After inputting [1E][34][[00] and then [0E][00][0D], press [→] or [←] key.



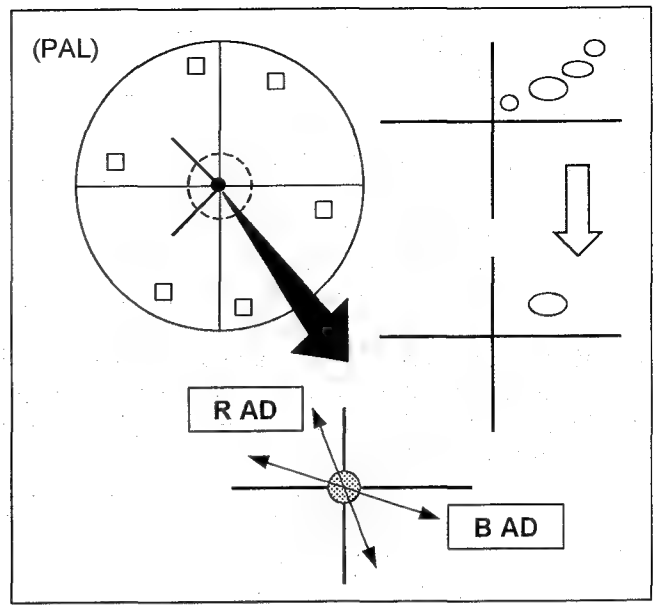
5-18. Rγ & Bγ Adjustment

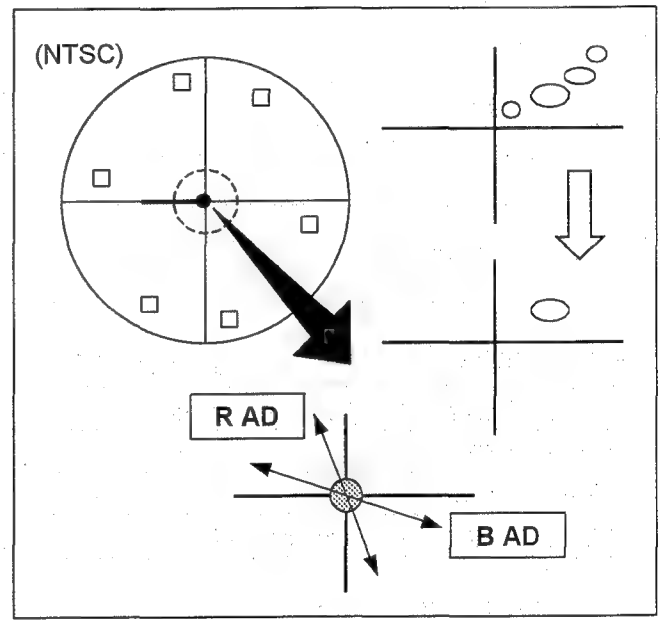
BOARD	CDS
TEST	CAM OUT(75Ω terminated)
ADJUST	VR101(R LVL), VR301(B LVL), EVR
F.NBR.	(2000LUX)
CHART	Grayscale Chart(3200 ° K)
M.EQ	Vector Scope, Lux Meter, Color Pyrometer, EVR

1. Set the Vector Scope to Gain : MAX.
2. Set the EVR to [1E][27][00].
3. Select PRESET position in AWB mode.
4. Execute the ABB function.
5. Open the iris until the peak level is 100% in CAM OUT **without extender**.
6. Confirm that the iris No. is F8 to F8-1/2.
7. When the dot is divided, adjust the **Rγ** and **Bγ** with EVR according to the following procedure so that the dots are joined.
8. **Rγ** : After inputting [0E][00][09] in EVR,
9. press the [→] or [←] to adjust.
10. **Bγ** : After inputting [0E][00][0A] in EVR,
11. press the [→] or [←] to adjust.
12. Confirm that the dot is at the center of the vector scope. If not, adjust the **VR101 (R LVL)** and **VR301 (B LVL)**.

<Note>

1. Vertically divided : Adjust **Rγ**
   Horizontally divided : Adjust **Bγ**

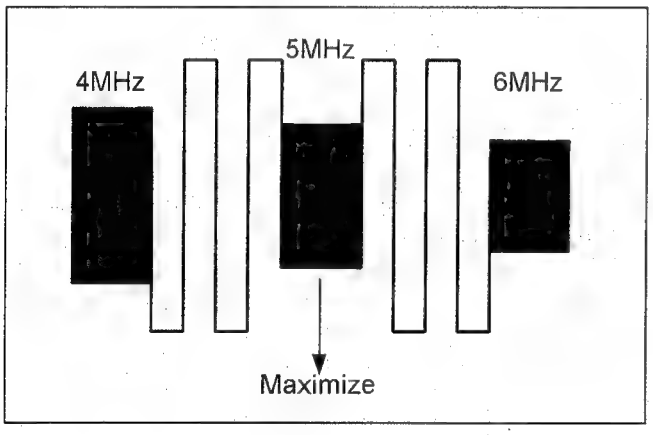




5-20. Modulation Adjustment

BOARD	Pulse, Sync
SPEC.	MAX at 5MHz
TEST	CAM OUT (75Ω terminated)
ADJUST	VR14 (MOD) (Pulse) VR201, VR202, VR203 (Sync)
CHART	Immega Chart
M.EQ	Waveform Monitor, EVR

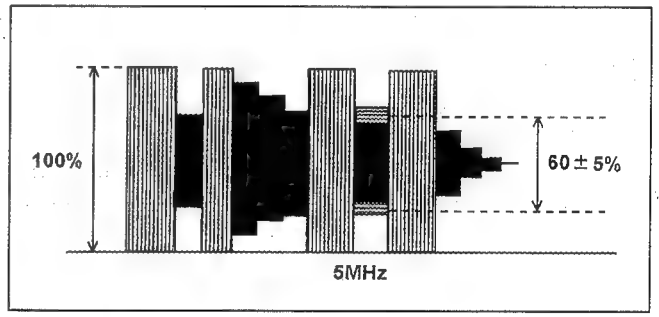
1. Turn the **VR14** fully counterclockwise.
2. Set Gain SW to **L**.
3. Press the [F2] and [3] keys to set the EVR to [1E][35][00].
4. Open the iris until white level is 80%.
5. Execute AWB function in the A ch.
6. Open the iris until white level is 90%.
7. Turn the **VR201 (Sync)** counterclockwise fully.
8. Turn the **VR201** clockwise until the level At 5MHz is maximized first.
9. Set shutter to 1/2000.
10. Set Gain SW to **M**.
11. Repeat from 6 to 8 with **VR202 (Sync)**.
12. Set Gain SW to **H**.
13. Repeat from 6 to 8 with **VR203 (Sync)**.
14. Set shutter OFF and Gain L.



5-21. Modulation Confirmation

BOARD	Pulse
SPEC.	60±5% at 5MHz
TEST	CAM OUT (75Ω terminated)
ADJUST	VR2 (CLMP PH) (Pulse)
CHART	Immega Chart
M.EQ	Waveform Monitor, EVR

1. Press the [F2] and [3] keys to set the EVR to [1E][35][00].
2. Open the iris until white level is 80%.
3. Execute AWB function in the A ch.
4. Open the iris F5.6 – F4.
5. Confirm that the level At 5MHz is within specification.
6. If not, fine-adjust the **VR2**. When **VR2** is adjusted, open the iris until white level is 80% and execute AWB function in the A ch.
7. Confirm that the level at 5MHz is within specification. (60±10% is accepted only when **VR2** is fully-turned.)
8. When **VR2** is adjusted, repeat from Modulation Adjustment.
9. Finally, set the EVR to [1E][3A][00].



<VTR Section>
6. Video Main & Video I/F

6-1. Audio VCO Adjustment

BOARD	Video Main
SPEC.	A = B±5%
TEST	TP8 (VCO ADJ.)
ADJUST	EVR
INPUT	CAMERA Colour Bar
MODE	EE
M.EQ	Oscilloscope

Menu Setting

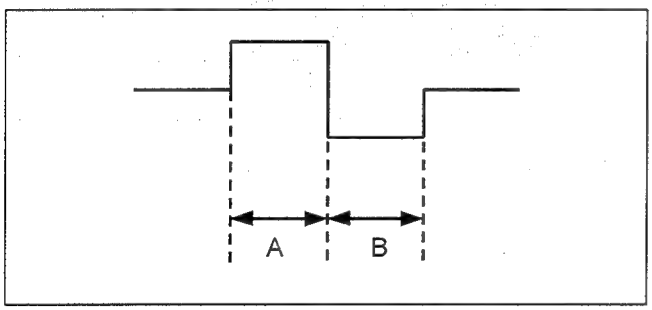
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 DATA : 82 ADR : **04**

1. Press [→] or [←] key in EVR so that **A** equals to **B**.



6-2. DA C Level Adjustment (for NTSC only)

BOARD	Video Main
SPEC.	A = 0.30±0.02V
TEST	TP4 (DA C)
ADJUST	EVR
INPUT	CAMERA Colour Bar
MODE	PLAY
M.EQ	Oscilloscope

Menu Setting

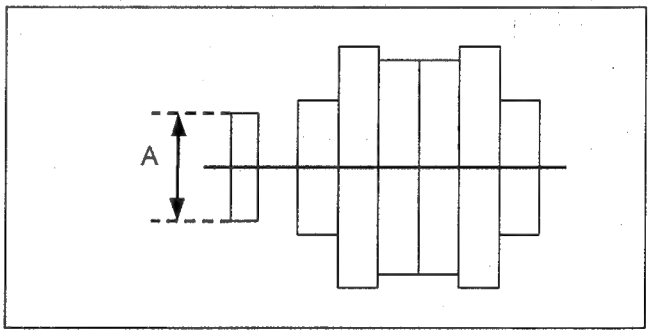
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 DATA : ?? ADR : **03**

1. Press [→] or [←] key in EVR so that the **level A** is within specification.



6-3. Sync Level Adjustment (for NTSC only)

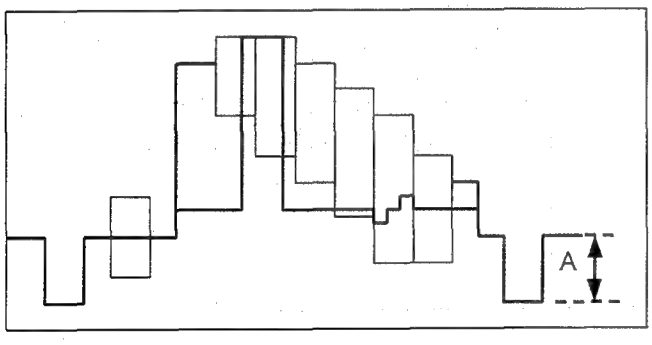
BOARD	Video Main
SPEC.	A = 0.286±0.004V
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR6 (Y)
INPUT	CAMERA Colour Bar
MODE	PLAY
M.EQ	Waveform Monitor

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

1. Adjust the **VR6 (Y)** so that the **level A** is within specification.



6-4. Y Level Adjustment (for NTSC only)

BOARD	Video Main
SPEC.	A = 1.00±0.02V
TEST	VIDEO OUT (75Ω terminated)
ADJUST	EVR
INPUT	CAMERA Colour Bar
MODE	PLAY
M.EQ	Waveform Monitor

Menu Setting

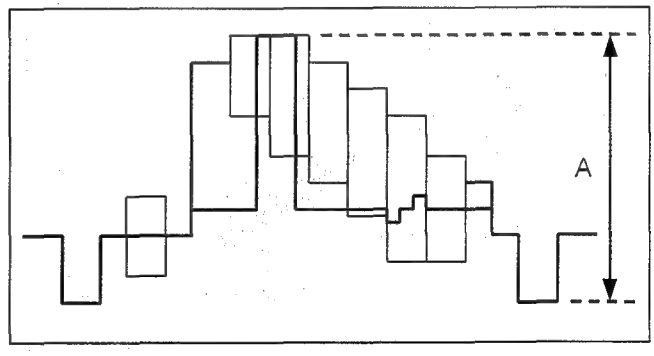
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 ADR : **02**

1. Press [→] or [←] key in EVR so that the **level A** is within specification.



6-5. Burst Level Adjustment (for NTSC only)

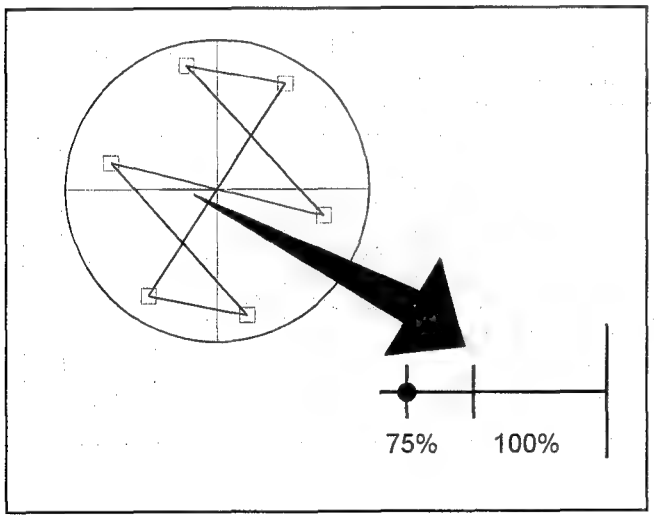
BOARD	Video Main
SPEC.	Burst Level = 75%
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR7 (C)
INPUT	CAMERA Colour Bar
MODE	PLAY
M.EQ	Vector Scope

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

1. Adjust the **VR7 (C)** so that the **bust level** is within specification.



6-6. Y Frequency Adjustment (for NTSC only)

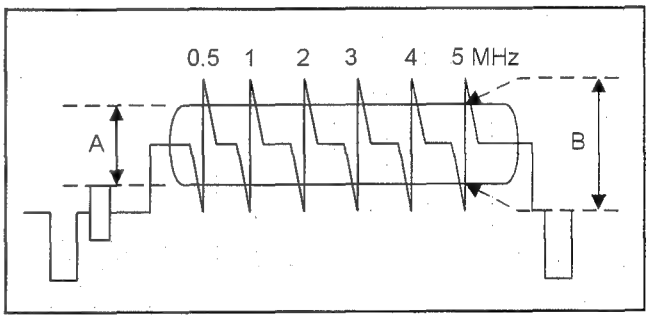
BOARD	Video Main
SPEC.	B/A = 5.0MHz±0.5dB
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR5 (Y TMG)
INPUT	CAMERA Colour Bar
MODE	PLAY
M.EQ	Waveform Monitor

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

1. Adjust the **VR5 (Y TMG)** so that the **B/A** is within specification.



6-7. Y/C Timing Adjustment (for NTSC only)

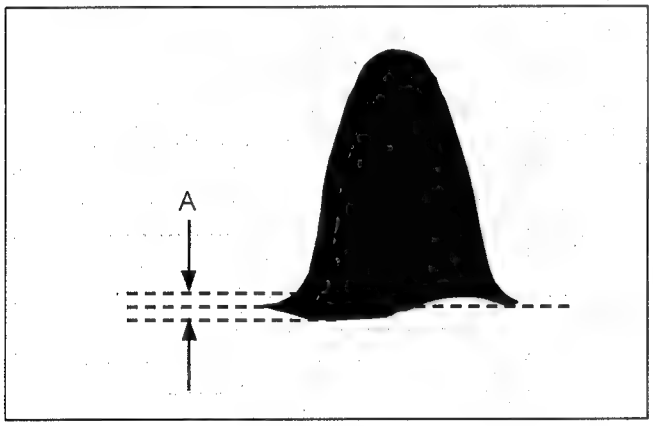
BOARD	Video I/F
SPEC.	A = Minimum (Flat)
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR5 (Y TMG)
INPUT	CAMERA Colour Bar
MODE	PLAY
M.EQ	Waveform Monitor

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

DESIGN : Y/C TIMING

1. After menu setting, turn **OFF** the switch and then turn **ON** again, and confirm that the level A.
2. Adjust the Y/C TIMING on MENU so that the level A is almost flat, and then adjust slightly by the **VR5**.



6-8. Video AD Input Level Adjustment (for NTSC only)

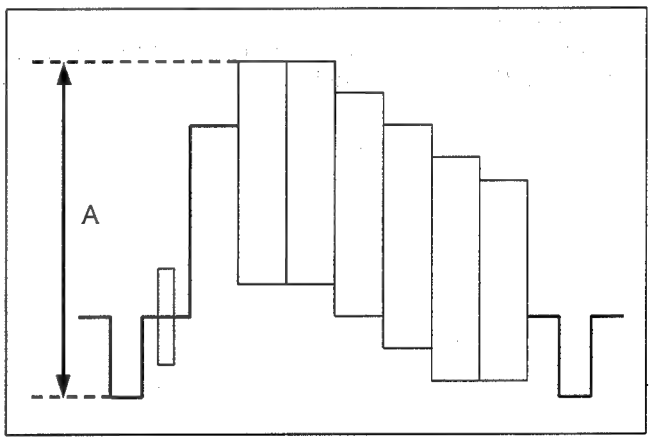
BOARD	Video I/F
SPEC.	A = 2.3±0.05V
TEST	TP1 (AD CPS)
ADJUST	VR1 (CPS LEV)
INPUT	CAMERA Colour Bar
MODE	EE
M.EQ	Oscilloscope

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : VIDEO
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

1. Input the color bar signal to VIDEO IN connector and adjust the **VR1** so that the **level A** is within specification.



6-9. APC Adjustment (for NTSC only)

BOARD	Video I/F
SPEC.	14.31818MHz±40Hz
TEST	TP2 (4FSC)
ADJUST	EVR
INPUT	No Burst
MODE	EE
M.EQ	Frequency Counter

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : VIDEO
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 DATA : 9C ADR : **1C**

1. Input the **composite signal (without Burst)** to VIDEO IN.
2. Press [→] or [←] key in EVR so that the frequency at the **TP2** is within specification.

6-10. Out Bias Adjustment (for NTSC only)

BOARD	Video I/F
SPEC.	B = A±3%
TEST	TP207 (AD PB)
ADJUST	EVR
INPUT	CAMERA Colour Bar
MODE	EE
M.EQ	Oscilloscope

Menu Setting

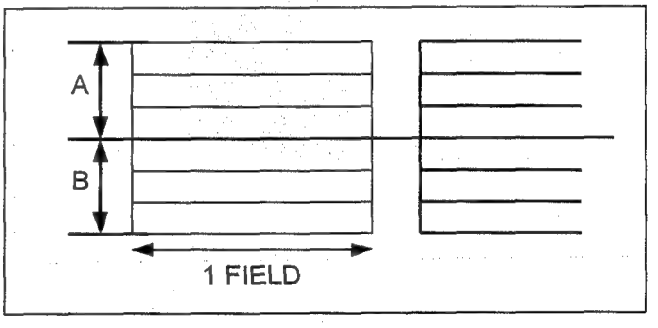
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : VIDEO
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 DATA : 8D ADR : **1A**

1. Monitor the **TP207** and press [→] or [←] key in EVR so that the **level A** and **B** are the same.



6-11. Hue Adjustment (for NTSC only)

BOARD	Video I/F
SPEC.	B = A±10%
TEST	TP207 (AD PB)
ADJUST	EVR
INPUT	CAMERA Colour Bar
MODE	EE
M.EQ	Oscilloscope

Menu Setting

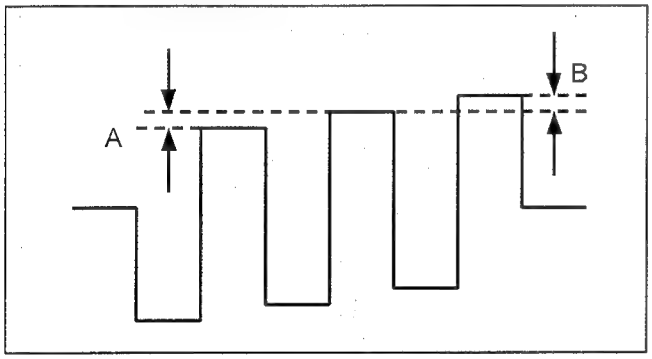
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : VIDEO
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 DATA : D0 ADR : **19**

1. Monitor the **TP207** and press [→] or [←] key in EVR so that the **level A** and **B** are the same.



6-12. PLL POS Adjustment

BOARD	Video I/F
SPEC.	B = A±10%
TEST	TP201 (HP), TP202 (HWIN)
ADJUST	EVR
INPUT	CAMERA Colour Bar
MODE	EE
M.EQ	Oscilloscope

Menu Setting

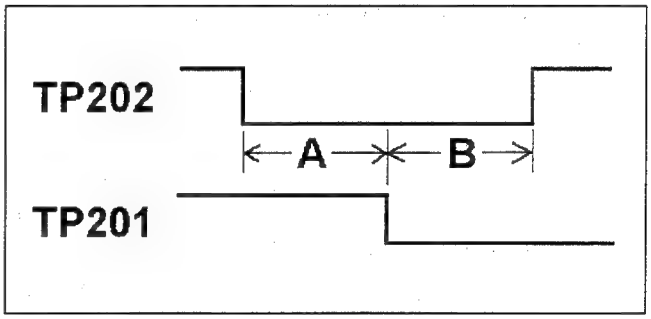
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows :

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 DATA : 77 ADR : **1B**

1. Press [→] or [←] key in EVR so that **A** equals to **B**.



6-13. ENC Y & Sync Level Adjustment (for PAL only)

BOARD	Video I/F
SPEC.	A = 700±15mV, B = 300 ± 4mV
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR602, EVR
MODE	PLAY
TAPE	VFM3680KM (0 ~ 10min)
M.EQ	Waveform Monitor

Menu Setting

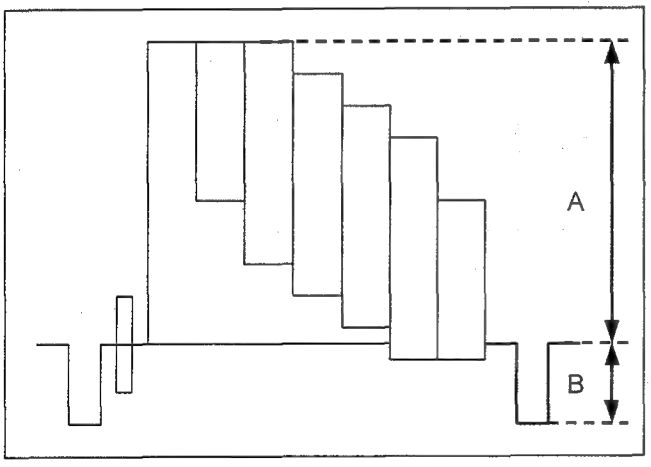
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows :

PAGE : FUNCTION 3/5
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 DATA : 86 ADR : **17**

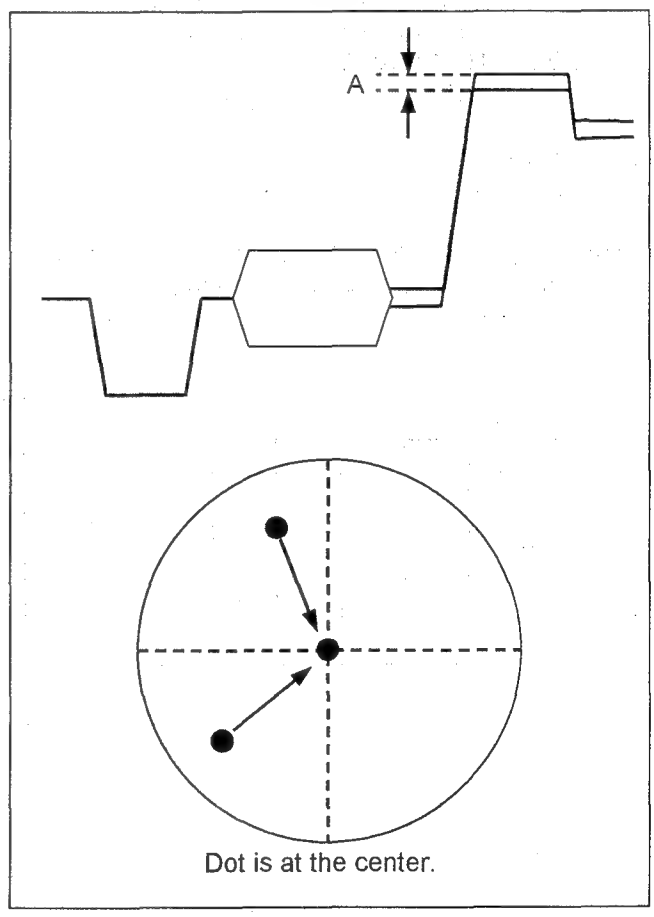
1. Press [→] or [←] key in EVR so that the **level A** is within specification.
2. Adjust the **VR602** so that the **level B** is within specification.



6-14. Carrier Balance Adjustment (for PAL only)

BOARD	Video I/F
SPEC.	A ≦ 10mV
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR609 (PR), VR610 (PB)
MODE	PLAY
TAPE	VFM3680KM (0 ~ 10min)
M.EQ	Waveform Monitor, Vector Scope

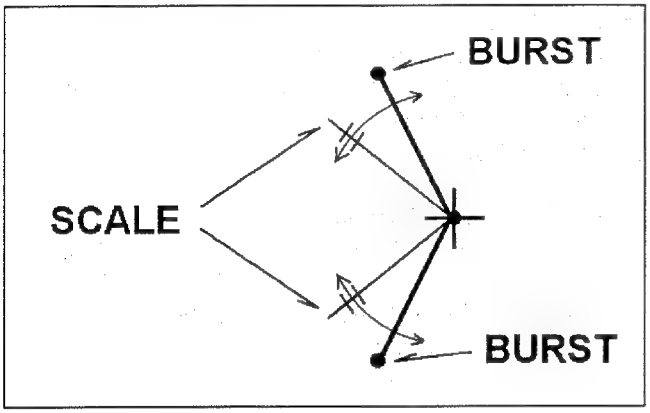
1. Adjust the **VR609** and **VR610** so that the dot is at the center of the vector scope.
2. Adjust the **VR609** so that the **width A** is minimized.
3. Adjust the **VR610** as well as **VR609**.
4. Repeat the above steps until the **width A** is within specification.



6-15. Burst Phase Adjustment (for PAL only)

BOARD	Video I/F
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR608
MODE	PLAY
TAPE	VFM3680KM (0 ~ 10min)
M.EQ	Vector Scope

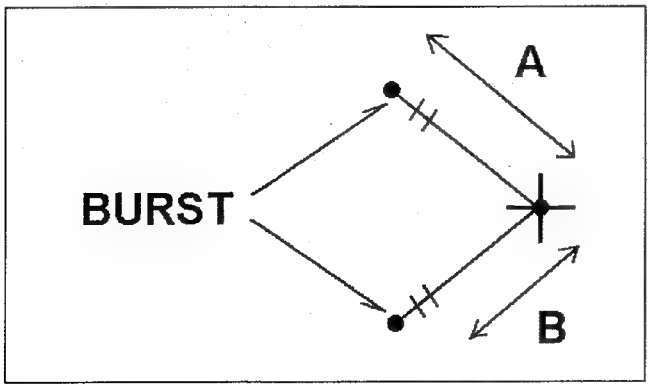
1. Adjust the **VR608** so that the **burst vectors** are fixed on the scale.



6-16. QUAD Adjustment (for PAL only)

BOARD	VIDEO I/F
TEST	VIDEO OUT (75Ω terminated)
SPEC.	A = B
ADJUST	VC601
MODE	PLAY
TAPE	VFM3680KM (0 ~ 10min)
M.EQ	Vector Scope

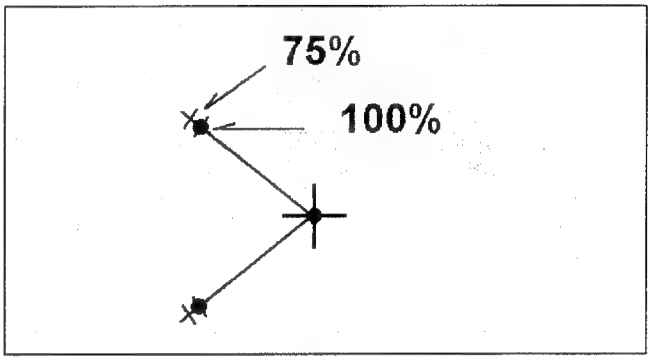
1. Adjust the **VC601** so that the **burst level A** and **B** are the same.



6-17. Burst Level Adjustment (for PAL only)

BOARD	Video I/F
SPEC.	100%
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR607
MODE	PLAY
TAPE	VFM3680KM (0 ~ 10min)
M.EQ	Vector Scope

1. Adjust the **VR607** so that the **burst levels** are within specification.



6-18. Chroma Level Adjustment (for PAL only)

BOARD	Video I/F
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR604, EVR
MODE	PLAY
TAPE	VFM3680KM (0 ~ 10min)
M.EQ	Vector Scope

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

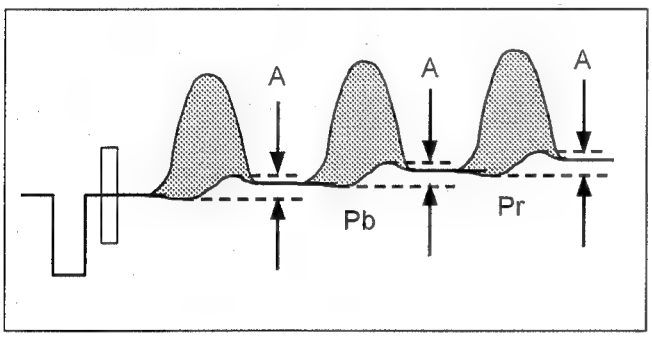
CMD : 02 DATA : 86 ADR : **16**

1. Press [→] or [←] key in EVR so that the R dot is in the marker of the vector scope.
2. If necessary, fine-adjust the **VC601**.
3. Adjust the **VR604** so that each dot is in the marker of the vector scope.

6-19. Y/C Timing Adjustment (for PAL only)

BOARD	Video I/F
SPEC.	A = Minimum (Flat)
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR603 (PB), VR605 (PR)
MODE	PLAY
TAPE	VFM3680KM (26 ~ 30min)
M.EQ	Waveform Monitor

1. Adjust the **VR603** and **VR605** so that the portion A is flat.



6-20. Pb Timing Adjustment

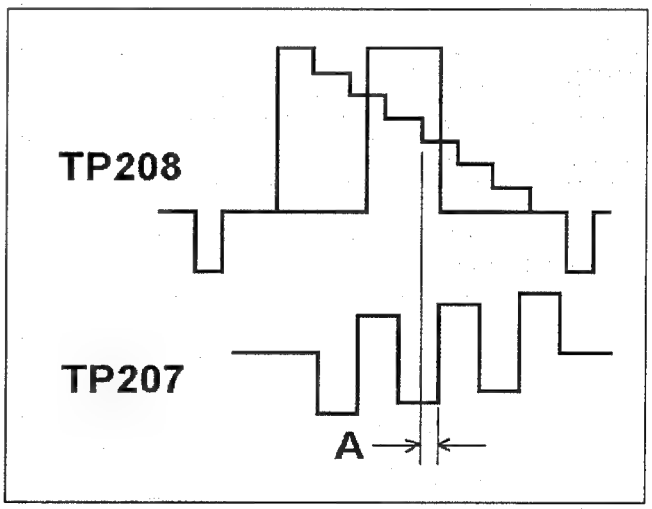
BOARD	Video I/F
SPEC.	NTSC : A = 0 ± 20ns (CAMERA) : A = 0 ± 50ns (VIDEO) PAL : A = 0 ± 20ns
TEST	TP207(AD PB), TP208(AD Y)
ADJUST	VR107(PB TMG)
INPUT	CAMERA Color Bar
MODE	EE
M.EQ	Oscilloscope

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM→VIDEO** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

1. Adjust the **VR107** so that the **phase difference A** between **TP207** and **TP208** is within specification.
2. (NTSC only) Select **VIDEO** in the menu of REC SIGNAL (FUNCTION 3/5).
3. (NTSC only) Confirm that the phase **difference A** is 0±50ns .



6-21. Pr Timing Adjustment

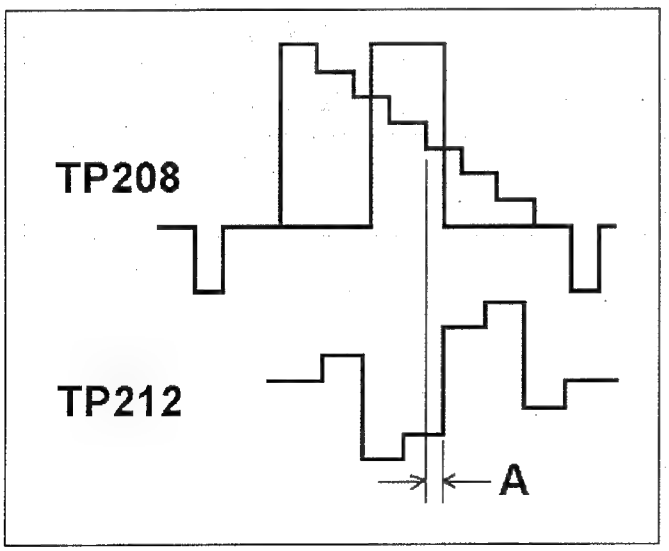
BOARD	Video I/F
SPEC.	NTSC : A = 0±20ns (CAMERA) : A = 0±50ns (VIDEO) PAL : A = 0±20ns
TEST	TP208 (AD Y), TP212 (AD PR)
ADJUST	VR111 (PR TMG)
INPUT	CAMERA Color Bar
MODE	EE
M.EQ	Oscilloscope

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM→VIDEO** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

1. Adjust the **VR111** so that the **phase difference A** between **TP212** and **TP208** is within specification.
2. (NTSC only) Select **VIDEO** in the menu of REC SIGNAL (FUNCTION 3/5).
3. (NTSC only) Confirm that the **phase difference A** is 0±50ns .



6-22. Y Clamp DC Adjustment

BOARD	Video I/F
TEST	TP301(Y PED)
ADJUST	EVR
INPUT	CAMERA Color Bar
MODE	EE
M.EQ	Oscilloscope

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : OFF

EVR Setting

CMD : 02 DATA : 73 ADR : **11**

1. Monitor the **TP301**and press [→] or [←] key in EVR so that the level is about 5 VDC (flat).
2. If flat 5VDC does not appear, adjust high level of pulse to 5V.

6-23. Y Level Adjustment

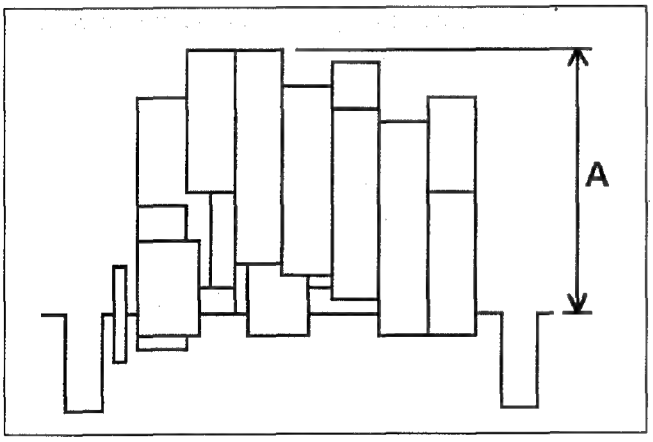
BOARD	Video I/F
SPEC.	NTSC : A = 714±15mV PAL : A = 700±15mV
TEST	VIDEO OUT (75Ωterminated)
ADJUST	VR104 (Y LEV)
INPUT	CAMERA Color Bar
MODE	EE
M.EQ	Waveform Monitor

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : ON

1. Monitor the VIDEO OUT and adjust the **VR104** so that the **level A** is within specification.



6-24. DEC Y Level Adjustment (for NTSC only)

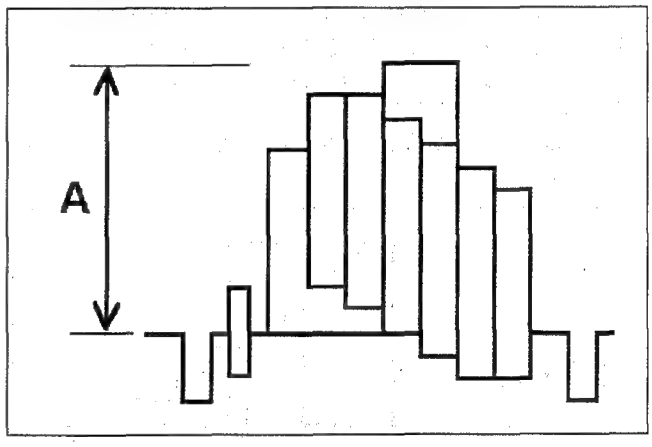
BOARD	Video I/F
SPEC.	A = 714±15mV
TEST	VIDEO OUT
ADJUST	VR2 (DEC Y LEV)
INPUT	CAMERA Color Bar
MODE	EE
M.EQ	Waveform Monitor

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **VIDEO**
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : ON

1. Monitor the VIDEO OUT and adjust the **VR2** so that the **level A** is within specification.



6-25. Camera Input Vector Adjustment

BOARD	Video I/F
TEST	VIDEO OUT (75Ωterminated)
ADJUST	VR108 (PB LEV), VR112 (PR LEV), EVR
INPUT	CAMERA Color Bar
MODE	EE
M.EQ	Vector Scope

Menu Setting

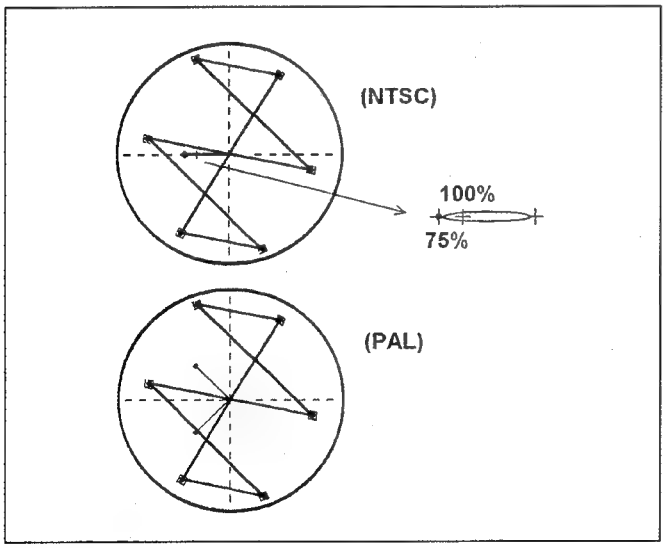
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **CAM** (NTSC only)
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : ON
PAGE : LEVEL 3/6
SET UP : **7.5%** (NTSC only)

EVR Setting

CMD : 02 DATA : 63 ADR : **12**
CMD : 02 DATA : 63 ADR : **13**

1. Adjust the **VR108** and **VR112** and press [→] or [←] key in EVR so that the vector center is at the center of the vector scope and each dot is in the marker of the vector scope.



<Note>

Do not use the extension board when execute this adjustment.

6-26. Video Input Vector Adjustment (NTSC only)

BOARD	Video I/F
TEST	VIDEO OUT (75Ωterminated)
ADJUST	VR105 (PB LEV), VR109 (PR LEV), EVR
INPUT	CAMERA Color Bar
MODE	EE
M.EQ	Vector Scope

Menu Setting

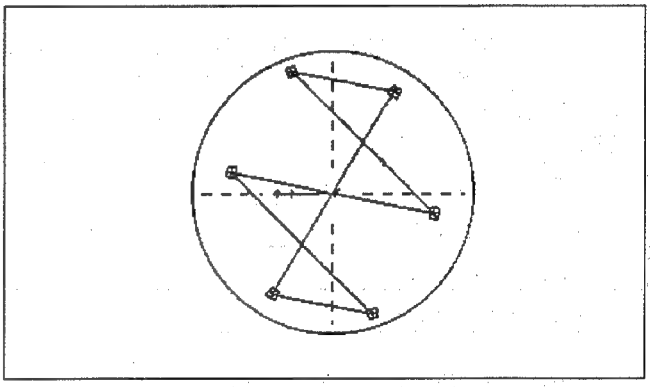
1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : FUNCTION 3/5
REC SIGNAL : **VIDEO**
ECU CONNECT : EVR
PAGE : SERVICE ADJ.
IF ADJ. : ON

EVR Setting

CMD : 02 DATA : D0 ADR : **19**

1. Adjust the **VR105** and **VR109** and press [→] or [←] key in EVR so that each dot is in the marker of the vector scope.



<Note>

This adjustment execute after completed the following item **"6-19. Camera Input Vector Adjustment"**.

7. Servo

7-1. Reel Torque Offset Adjustment

BOARD	Servo
SPEC.	20±2mV
TEST	TP301 (S), TP302 (T), TG300 (GND)
ADJUST	VR501 (T), VR502 (S)
MODE	PLAY
M.EQ	Digital Volt Meter

1. Confirm the power off and make a short-circuit between **TP116** and **TP505**.
2. Turn the power ON and then set the tube* to cover the sensor LED and place the unit in no tape loading mode.
3. Hold the S-Reel by hand and press the PLAY key.
4. Adjust the **VR502** so that the **TP301 (S-Reel)** is within specification.
5. Hold the T-Reel by hand and press the PLAY key.
6. Adjust the **VR501** so that the **TP302 (T-Reel)** is within specification.
7. Make a open-circuit between **TP200** and **TP505**.

<Note>

1. Make a black tube* by yourself.

7-2. Tension Offset Current Adjustment

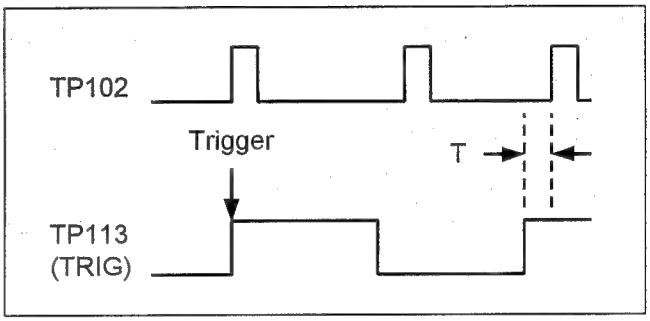
BOARD	Servo
SPEC.	2.5±0.1V
TEST	TP402
ADJUST	VR402
MODE	EJECT
M.EQ	Digital Volt Meter

1. Adjust the **VR402** so that the **TP402** voltage is within specification.

7-3. PG Shifter Adjustment

BOARD	Servo
SPEC.	126.3±2.5 μs
TEST	TP113, TP102
ADJUST	VR101
MODE	PLAY
TAPE	Color Bar
M.EQ	Oscilloscope

1. Adjust the **VR101** so that the **T** is within specification. (Trigger : TP113)

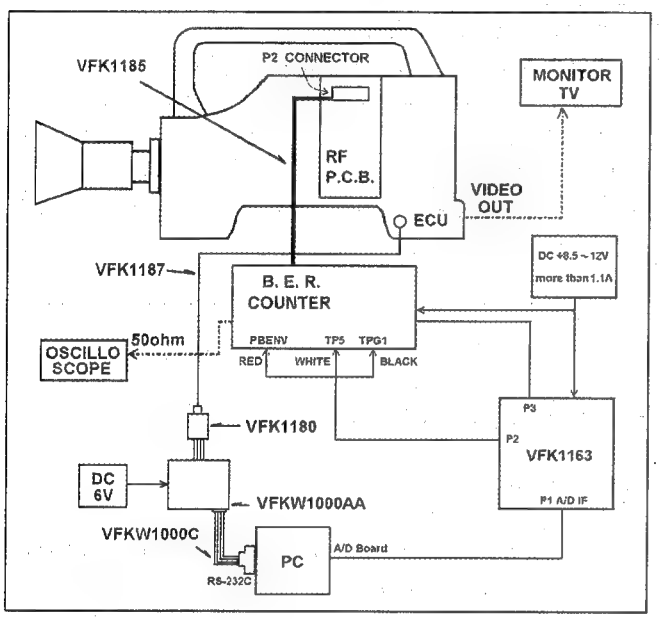


8. RF

8-1. System Hook Up and Setting

- **System Hook Up**

1. Connect the Camera with the Auto EQ/RF Adjustment System as shown below.
2. IC connection lip cable from the VFK1185 is not necessary (open).
3. Set the switches on the B. E. R. counter as follows.
   ERROR COUNT SW : ON
   CH SELECT SW : AUTO
   (L/R : Any one)



- **Menu Setting on Camera Recorder**

1. Open the operation panel.
2. Press [SHIFT], [→] and [←] buttons, and set the MENU switch to the SET position.
3. Set the switches on the B. E. R. counter as follows.
   PAGE : SEVICE ADJ.
   ECU CONNECT : EVR
   CONCEAL : OFF
   INNER ECC : OFF
   OUTER ECC : OFF
   SERVO MODE : ATF
4. After the above menu setting, close the menu mode.

- **Auto Adjustment System Normalization (Calibration)**

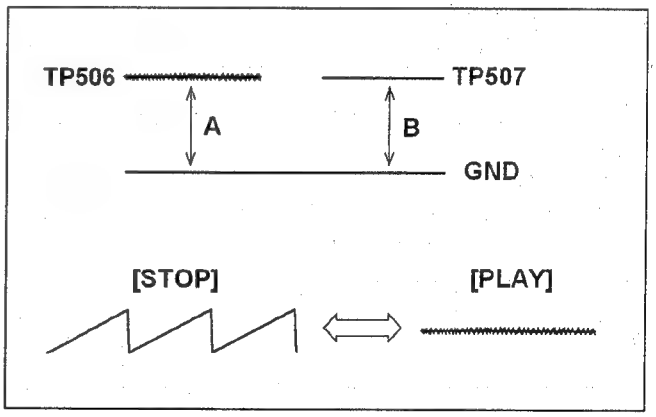
The system normalization (calibration) should be performed when using the adjustment system at the first time (after the completion of the system hook up) or changing the A/D board, PC or EQ tool.
Also, we recommend to perform it regularly.
The auto adjustment system normalization procedure, please refer to **"8-10. Auto Adjustment System Normalization (Calibration) Procedure"** .

8-2. PLL VCO Adjustment

BOARD	RF
SPEC.	A = B = 2.0±0.1V
TEST	TP506, TP507
ADJUST	EVR
MODE	PLAY
TAPE	CAMERA Colour Bar
M.EQ	Oscilloscope, EVR

EVR Setting
CMD : 02 DATA : **7A** ADR : **0B**

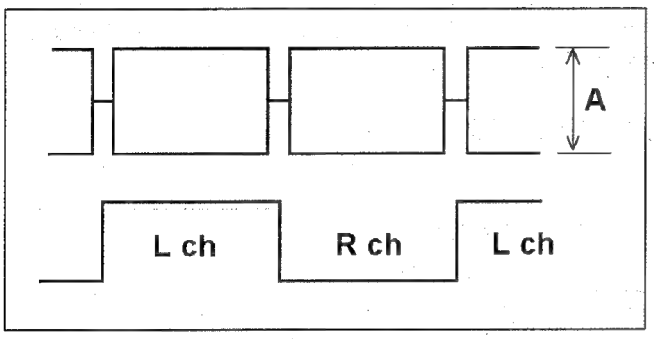
1. Monitor the **TP506** and **507** in the DC mode.
2. Press the [→] or [←] button in EVR so that the **levels A** and **B** are the same.



8-3. R/P Envelope Level Confirmation

BOARD	RF
SPEC.	A ≧ 70mV
TEST	R/P ENV, HSW (B.E.R. Counter) (50Ω terminated)
MODE	PLAY
TAPE	CAMERA Colour Bar
M.EQ	Oscilloscope

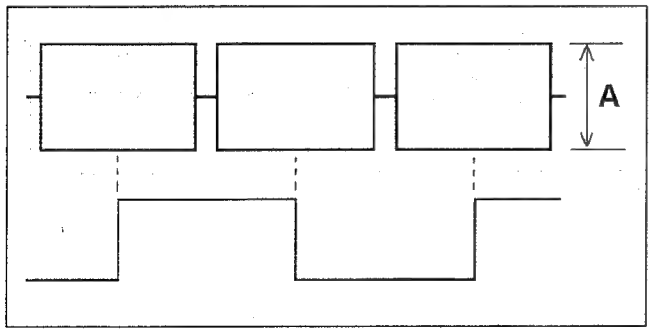
1. Confirm that the waveform is flat.



8-4. PB Envelope Level Adjustment

BOARD	RF
SPEC.	100±10mV
TEST	PB ENV, HSW (B.E.R. Counter) (50Ω terminated)
ADJUST	VR400 (PB L), VR401 (PB R)
MODE	PLAY
TAPE	CAMERA Color Bar
M.EQ	Oscilloscope

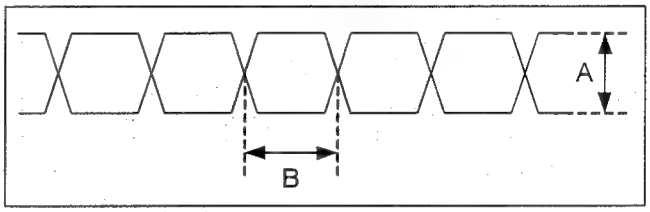
1. Confirm that the waveform is as shown in figure below.
2. Adjust the **VR400 (L ch)** and **VR401 (R ch)** so that the **level A** is within specification.



8-5. HSE Input Confirmation

BOARD	RF
SPEC.	A = 1.3±0.1V, B = 24.0±1ns
TEST	TP201, TP300 (Trigger)
ADJUST	VR200 (DUTY)
MODE	REC
TAPE	Blank Tape
M.EQ	Oscilloscope

1. Set the oscilloscope to AC mode.
2. Monitor the **TP201** and confirm that the **A** is within specification.
3. Confirm that the **B** is within specification.
4. If necessary, adjust the **VR200** slightly.



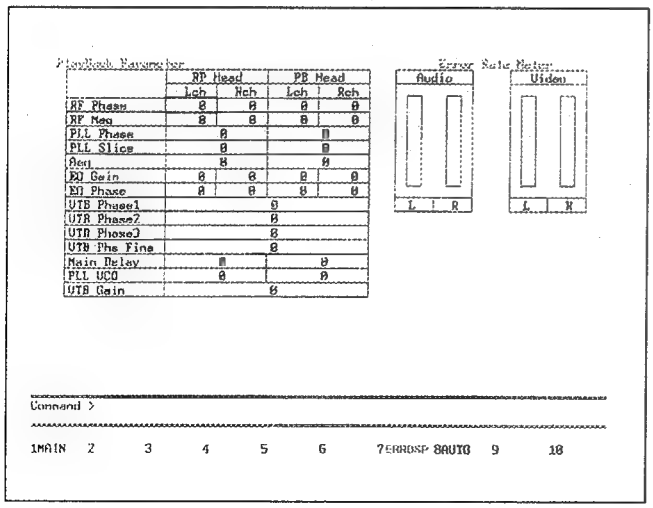
8-6. PB Equalizer Adjustment (Auto)

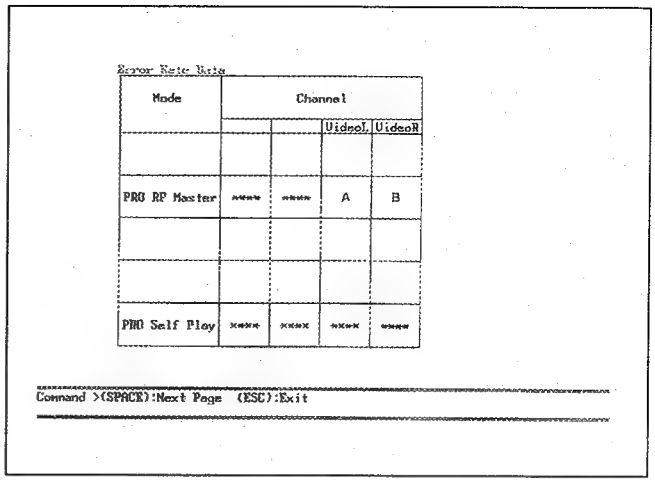
Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [→] and [←] buttons, set MENU switch to SET position.
3. Set as follows:
   PAGE : FUNCTION 3/5
   ECU CONNECT : EVR
   PAGE : SERVICE ADJ.
   CONCEAL : OFF
   INNER ECC : OFF
   OUTER ECC : OFF
   SERVO MODE : ATF
4. After the above setting, close the menu.

Auto Adjustment Software Boot Up

1. Copy the all files contained in floppy disk (VFK1160B) to a directory of hard disc drive. (ex. "C:¥DVCEQ")
2. Execute DVCRF. EXE file on the DOS command prompt condition. (ex. "C:¥DVCEQ¥DVCRF")
3. Select (2) AJ-D700 in DVCPRO MODEL SELECT.
4. Select (1) NORMAL in PROGRAM SELECT.
5. Wait about 20 seconds for parameter loading. To short cut this 20 seconds, confirm the power switch of the all equipment are turned ON and then press the "ENTRY" key.
6. Personal Computer (PC) asks "Do you transfer BOOT PROGRAM?" then once turn the power switch of the EVR I/F box OFF and ON, and then select the [Y].
7. PC asks whether any error has happened or not.
8. MAIN MENU is available.
   F1 MENU
   1. PB Adjustment
   2. REC Adjustment
   3. Result
   4. File
   5. Restart
   6. End
9. Select 1. PB Adjustment.
10. Select whether downloading data from VTR or not.
11. Press F8 to select AUTO.
12. Confirm that there is no tape in the VTR and press the [ENTER] key.
13. PC asks "Initial Adjust?". Select the [Y].
14. Select 1. All Adjust in PB Auto Menu.
15. Insert an Alignment tape and play back colour bar portion according to the instruction on the display.
16. During the auto adjustment don't touch the VTR, TOOL and PC.
    Please note that the audio error rate is not displayed in the auto adjustment.



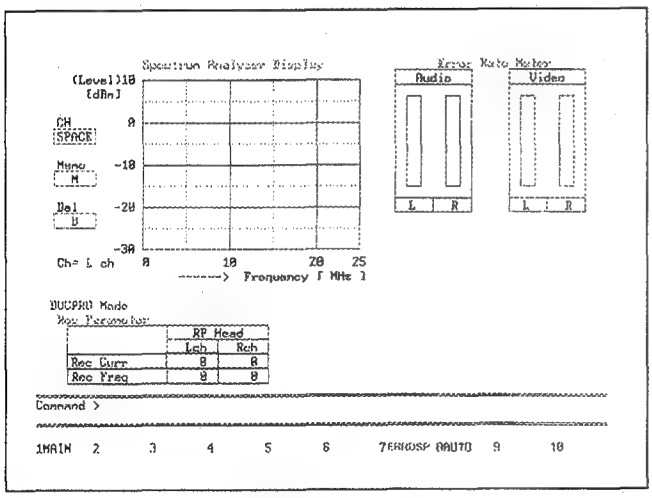


17. Adjustment may complete after 5-6 minutes.
18. Error rate is measured and displayed.
19. Confirm that the data A and B are green colour. If there is any red colour, try the same adjustment again after cleaning of the video head and tap transportation.

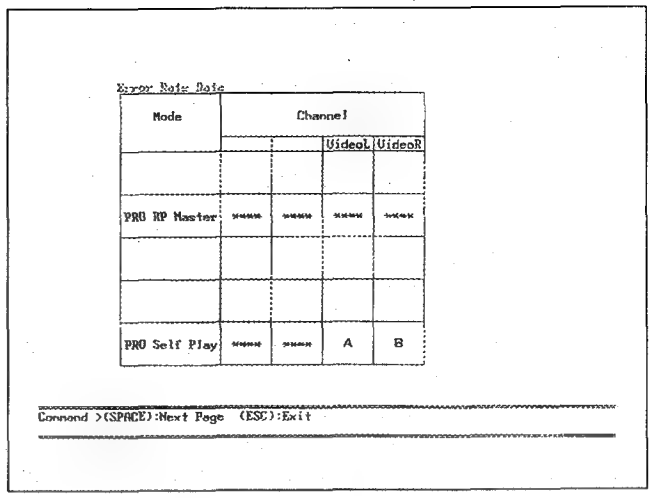
8-7. Rec. Curr. & Freq. Adj. (Auto)

BOARD	RF
TEST	PB ENV, HID R (50Ωterminated)
ADJUST	VR400 (PB L), VR401 (PB R), EVR
MODE	PLAY, REC
TAPE	Blank Tape
M.EQ	Oscilloscope, Spectrum Analyzer

1. Open the MAIN MENU according to the same procedure as the PB Equalizer Adjustment.
2. Select 2. REC Adjustment in the MAIN MENU.
3. PC asks whether download the VT. Data from the VTR or not.
4. Select [Y] so that the VT. Adjustment data is saved in to the PC.
5. Press the F8 to select the AUTO.
6. Select 1. Adjust start in the sub menu.
7. Insert the alignment tape and playback the colour bar portion according to the instruction on the display.
8. After memorizing the playback data, insert a blank tape and start a recording according to the instruction on the display.
9. During the adjustment, don't touch the VT. and PC adjustment system.
10. During the adjustment, audio error rate in not displayed.



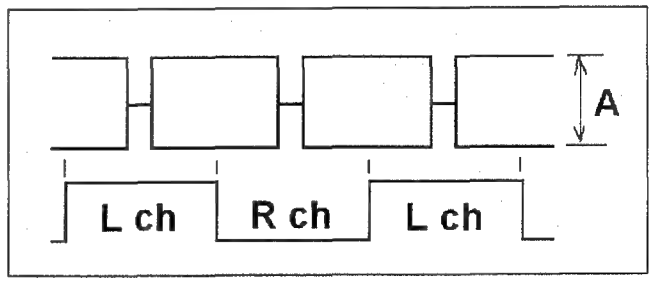
11. Rewind the recorded tape which was recorded on the blank tape and playback the recorded portion according to the instruction on the display.
12. The error rate is measured and displayed.
13. Confirm that the data A and B are green colour.



8-8. Confidence PB Envelope Level Adjustment

BOARD	RF
SPEC.	A = 100±10mV
TEST	PB ENV, HSW (B.E.R. Counter) (50Ωterminated)
ADJUST	VR400 (PB L), VR401 (PB R)
INPUT	CAMERA Color Bar
MODE	REC
TAPE	Blank Tape
M.EQ	Oscilloscope

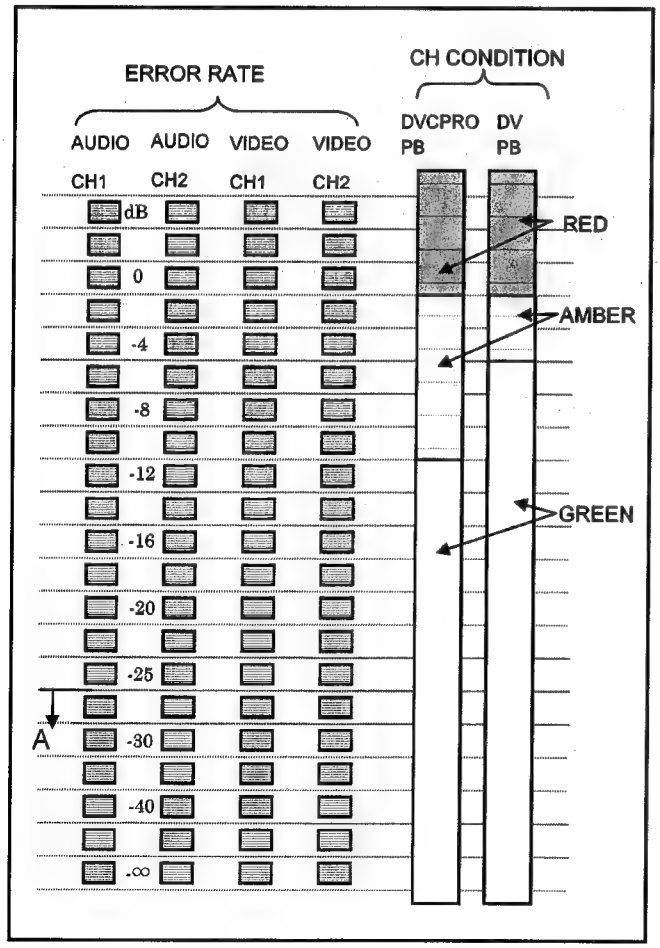
1. Place the unit in the confidence PB mode.
2. Adjust the **VR400** and **401** so that the **level A** is within specification.



8-9. Final Confirmation

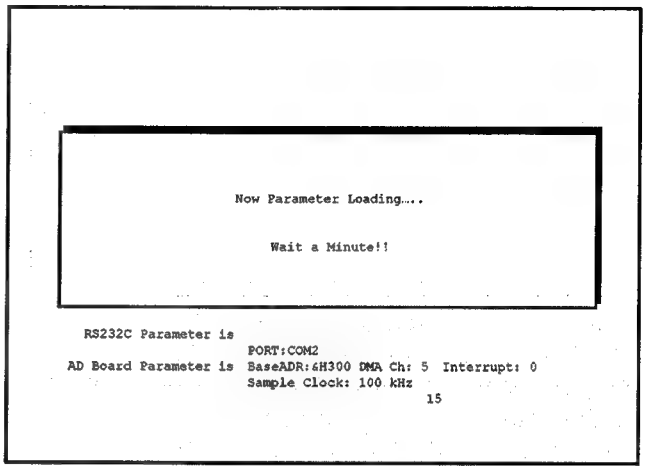
BOARD	RF
TEST	VIDEO OUT
INPUT	CAMERA Color Bar
MODE	REC, PLAY
M.EQ	B.E.R. Counter, Monitor TV

1. Record the internal colour bar signal.
2. Playback the recorded portion.
3. Confirm that the error rate is less than **250** on the L and R channels.
4. Playback the recorded portion on a studio editing DVCPRO and confirm that the error rate is less than A as shown in the figure below.
5. If it is not less than a, readjust Rec Current and Frequency Response.
6. Set the menu as follows:
   PAGE : SERVICE ADJ.
   INNER ECC : ON
   OUTER ECC : ON
7. Confirm that there is no error in the playback picture.

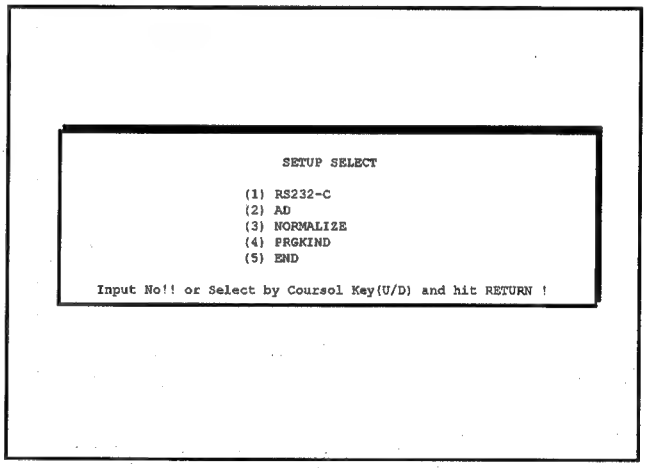


8-10. Auto Adjustment System Normalization (Calibration) Procedures

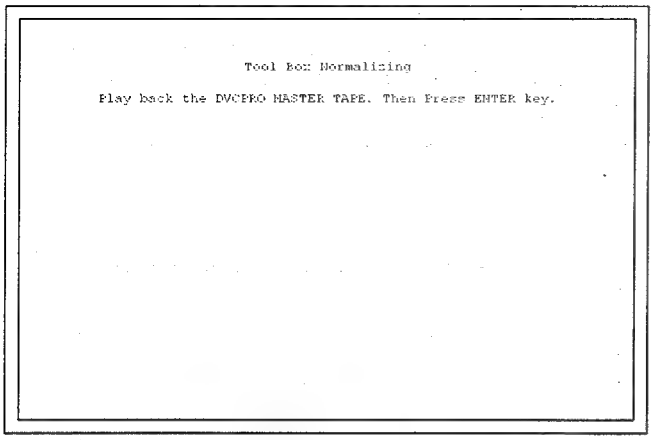
1. Boot up the auto adjustment system according paragraph **"8-6. PB Equalizer Adjustment (AUTO)"**.



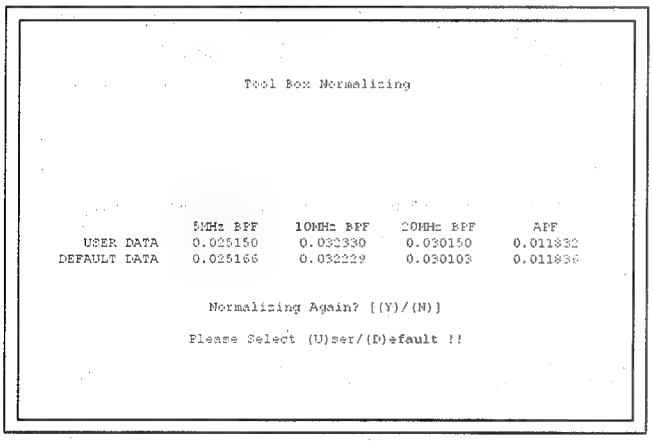
2 During the parameter count down, press the "F2" as shown in figure below.
3. Select "(3) NORMALIZE" when the display shows "SET UP SELECT" as shown the figure below.



4. When display shows "TOOL BOX NORMALIZING", playback the colour bar portion of the alignment tape and press the ENTER key.



5. Wait for the complain of USER DATA measurement. When measurement is completed, the display shows the USER DATA and DEFAULT DATA at the upper side of the display.
6. Compare the USER DATA and DEFAULT DATA, and confirm that the difference is within ±0.01 as shown in figure below.
7. The PC asks "NORMALIZING AGAIN?".



8. If value is within the specification, press the "N" key.
9. The PC asks "PLEASE SELECT (U)ser/(D)efault".
10. Press "U" to select the USER. This USER data becomes as the DEFAULT data from the next operation as shown in figure above.
11. If the value is not within specification, confirm the connection of the adjustment system and quality of the alignment tape, and perform the above steps 7 and 8 again.
12. ("NORMALIZING AGAIN?", press the "Y".)
13. If it is not improved after several times may be something wrong with the EQ tool.
14. When performing the Auto Adjustment System Normalization regularly under condition of the same combination of the PC, A/D Board and EQ Tool, the difference of USER DATA and DEFAULT DATA should be within ±0.005

[Manual Adjustment]

Initial Setting (Manual)

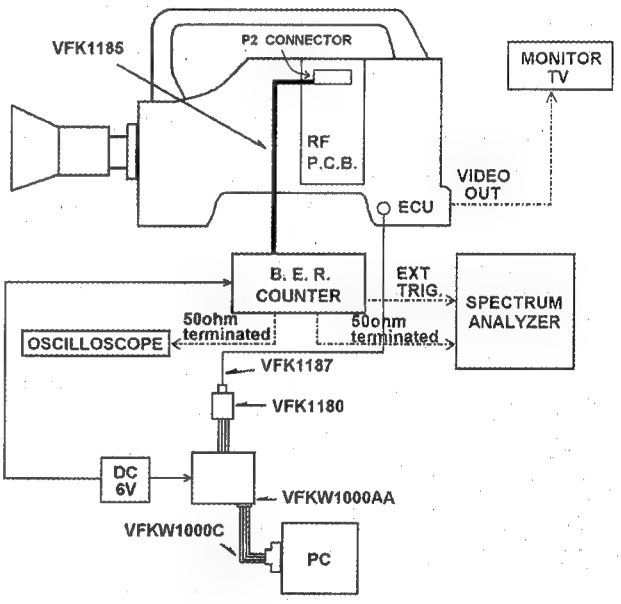
<Note>

Following procedures are required when using spectrum analyzer instead of RF Adjustment Tool.

1. Connect the Camera Recorder, EVR and B.E.R. counter as shown in figure.

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:
   PAGE : FUNCTION 3/5
   ECU CONNECT : EVR
   PAGE : SERVICE ADJ.
   CONCEAL : OFF
4. After setting turn the menu OFF.



PB Equalizer Adjustment 1 (Manual)

BOARD	RF
SPEC.	A = 20.93±0.1MHz
TEST	EYE PAT, HSW (B.E.R. Counter)
ADJUST	EVR
MODE	PLAY
TAPE	Color Bar
M.EQ	Spectrum Analyzer, EVR

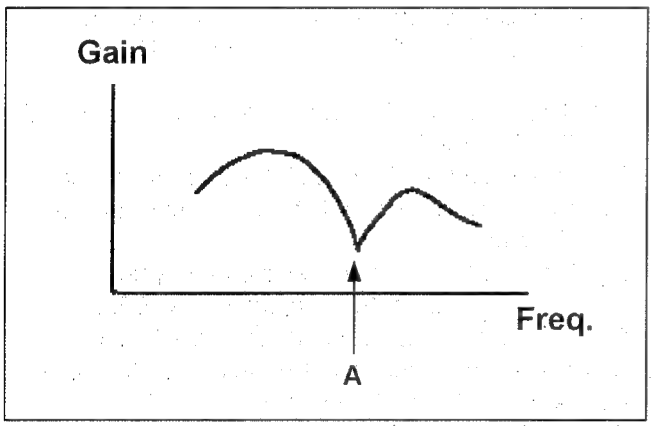
Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [→] and [←] buttons, set MENU switch to SET position.
3. Set as follows:
   PAGE : FUNCTION 3/5
   ECU CONNECT :EVR
   PAGE : SERVICE ADJ.
   CONCEAL :OFF
   INNER ECC :OFF
   OUTER ECC :OFF
4. After setting turn the menu OFF.

EVR Setting

CMD : 02 DATA : **C4** ADR : **0E**

1. Press the [→] or [←] key in EVR so that the **frequency at A portion** is within specification.



PB Equalizer Adjustment 2 (Manual)

BOARD	RF
TEST	VIDEO OUT, B.E.R. Counter
ADJUST	EVR
MODE	PLAY
TAPE	Color Bar
M.EQ	B.E.R. Counter, Monitor TV

EVR Setting

CMD : 02 DATA : **90** ADR : **07** (EQα L)
CMD : 02 DATA : **90** ADR : **08** (EQα R)
CMD : 02 DATA : **35** ADR : **09** (EQβ L)
CMD : 02 DATA : **35** ADR : **0A** (EQβ R)
CMD : 02 DATA : **66** ADR : **0D** (PLL SL)
CMD : 02 DATA : **9E** ADR : **0F** (PLL POS)
CMD : 02 DATA : **CC** ADR : **10** (AUTO EQ)

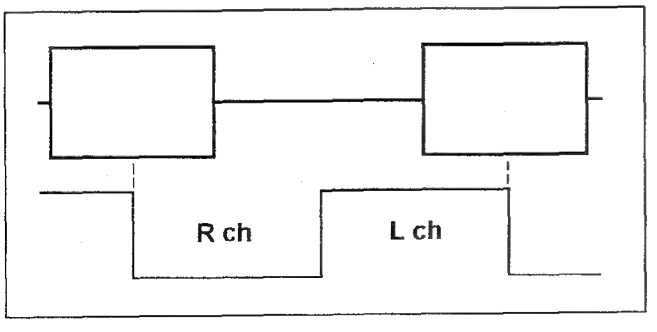
1. Monitor the VIDEO OUT in monitor TV.
2. Set the ERROR COUNT ON in the B.E.R. counter.
3. Select **L ch** in the B.E.R. Counter.
4. Repeat adjusting the **EQα L, EQβ L, PLL SL, PLL POS** and **AUTO EQ** until the error rate is minimized. (Start from the initial setting mentioned above and press [→] or [←] key in EVR to adjust.)
5. Select **R ch** in the B.E.R. Counter.
6. Fine-adjust the **EQα R** and **EQβ R** until the error rate is minimized.

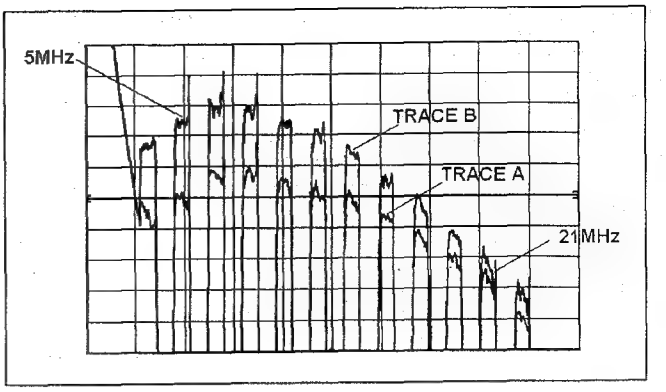
Rec. Curr. & Freq. (L ch) Adjustment (Manual)

BOARD	RF
TEST	PB ENV, HSW (B.E.R. Counter)
ADJUST	VR401(PB R), EVR
INPUT	CAMERA Color Bar
MODE	PLAY, REC
TAPE	Color Bar, Blank Tape
M.EQ	Oscilloscope, Spectrum Analyzer, EVR

EVR Setting
CMD : 02 DATA : **80** ADR : **20** (REC CUR L)
CMD : 02 DATA : **FF** ADR : **1E** (REC FRE L)

1. Play back the color bar tape and monitor the HSW and PB ENV (50Ω terminated).
2. Turn the **VR401** until the R ch level is minimized.
3. Input the PB ENV to the spectrum analyzer.
4. Store the average of 30 samples in TRACE B.
5. Eject the alignment tape and insert the blank tape.
6. Monitor the PB envelope in the spectrum analyzer without averaging.
7. Set the EVR to **REC CUR L** mode.
8. Press the [→] or [←] key in EVR so that the level of confidence PB at 5MHz is 4dB lower than that of TRACE B.
9. Set the EVR to **REC FRE L** mode.
10. Press the [←] key in EVR until the level at 21MHz is maximized first.
11. Set the EVR to **REC CUR L** mode.
12. Press the [→] or [←] so that the level at 5MHz is the same as TRACE B.
13. If the level of confidence PB at 21MHz is lower than TRACE B, adjust so that the spectrum of confidence PB is a similar figure to TRACE B in the range less than 20MHz.
14. If the level of confidence PB at 21MHz is higher than TRACE B, adjust so that the level of confidence PB around 5MHz is the same as TRACE B regardless of similarity.





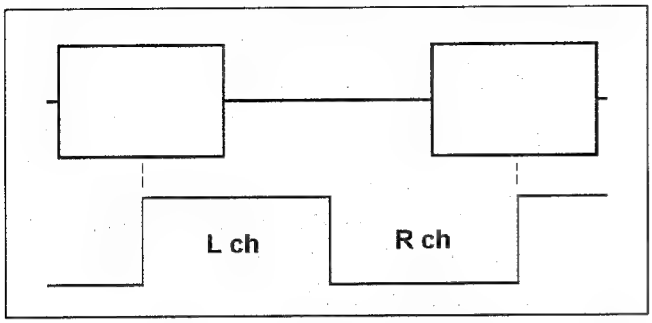
Rec. Curr. & Freq. (R ch) Adjustment (Manual)

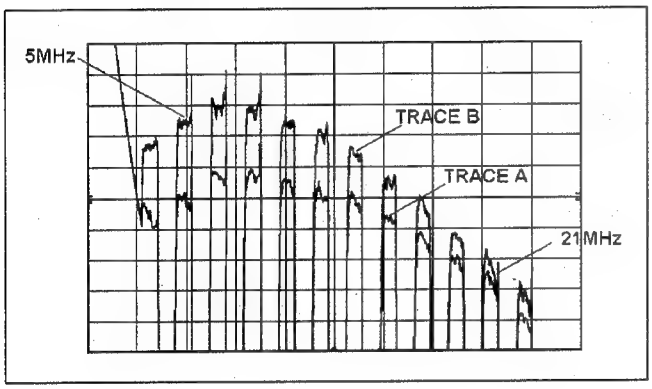
BOARD	RF
SPEC.	A = 100±10mV
TEST	PB ENV, HSW (B.E.R. Counter)
ADJUST	VR400 (PB L), VR401 (PB R), EVR
INPUT	CAMERA Color Bar
MODE	PLAY, REC
TAPE	Color Bar, Blank Tape
M.EQ	Oscilloscope, Spectrum Analyzer, EVR

EVR Setting
CMD : 02 DATA : **80** ADR : **21** (REC CUR R)
CMD : 02 DATA : **FF** ADR : **1F** (REC FRE R)

1. Play back the color bar tape and monitor the HSW and PB ENV (50Ω terminated).
2. Turn the **VR400** until the L ch level is minimized.
3. Adjust the **VR401** so that the R ch level is within specification.
4. Input the PB ENV to the spectrum analyzer.
5. Store the average of 30 samples in TRACE B.
6. Eject the alignment tape and insert the blank tape.
7. Monitor the confidence PB envelope in the spectrum analyzer without averaging.
8. Set the EVR to **REC CUR R** mode.
9. Press the [→] or [←] key in EVR so that the level of confidence PB at 5MHz is 4dB lower than that of TRACE B.
10. Set the EVR to **REC FRE R** mode.
11. Press the [←] key in EVR until the level at 21MHz is maximized first.
12. Set the EVR to **REC CUR R** mode.
13. Press the [→] or [←] so that the level at 5MHz is the same as TRACE B.

14. If the level of confidence PB at 21MHz is lower than TRACE B, adjust so that the spectrum of confidence PB is a similar figure to TRACE B in the range less than 20MHz.
15. If the level of confidence PB at 21MHz is higher than TRACE B, adjust so that the level of confidence PB around 5MHz is the same as TRACE B regardless of similarity.





9. Audio LCD

9-1. Initial Setting

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [→] and [←] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : MAIN FUNCTION

PHANTOM FRONT	: OFF
PHANTOM CH1	: OFF
PHANTOM CH2	: OFF

PAGE : FUNCTION 4/5

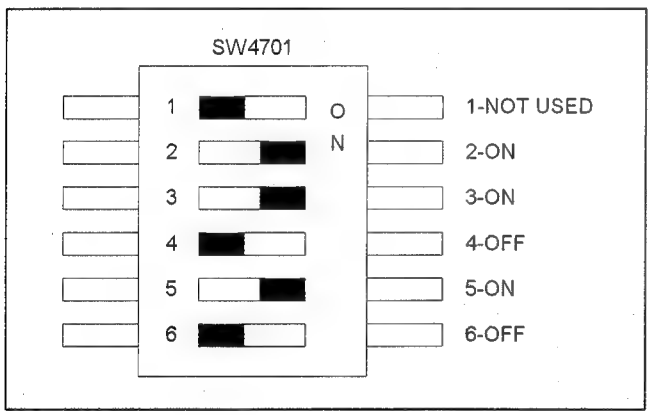
FRONT MIC	: -60dB
REAR MIC CH1	: -60dB
REAR MIC CH2	:-60dB
LINE CH1/CH2	: (NTSC) +4dB
	: (PAL) 0dB
STEREO/MONO	: STEREO
MIC FILTER CH1	: OFF
MIC FILTER CH2	: OFF
EMPHASIS	: OFF

PAGE : FUNCTION 5/5

AUDIO OUT SEL	: CH1
LIMITER	: OFF
TEST SIGNAL	: OFF

4. After setting turn the menu OFF.

1. Set the **SW4701** on Audio LCD board as shown in figure.



9-2. Playback Level Adjustment

BOARD	Audio LCD
SPEC.	(CH 1/CH 2) -20dBu±0.2dB (AUDIO OUT) (NTSC) 4dBu±0.2dB (PAL) 0dBu±0.2dB
TEST	Multi Connector CH1/CH2 (12P) AUDIO OUT (XLR-3P) (12P)
ADJUST	VR301 (CH1), VR401 (CH2), VR701
MODE	PLAY
TAPE	(NTSC) VFM3580KM (No.1:0~14min) (PAL) VFM3680KM (No.1:0~10min)
M.EQ	<1> Audio Precision, VFK1210 <2> VTVM, SHAN-C12TCA

SW Setting

AUDIO IN CH1 : REAR, LINE
AUDIO IN CH2 : REAR, LINE
AUDIO SELECT : MANUAL

<1. Using Audio Precision>

1. Connect multi connector with Audio Precision using VFK1210.
2. Adjust the **VR301 (CH 1)** so that the levels of **CH 1** (12pin multi connector) is within specification.
3. Adjust the **VR401 (CH 2)** so that the levels of **CH 2** (12pin multi connector) is within specification.
4. Adjust the **VR701** so that the level of **AUDIO OUT** (XLR at Rear Jack) is within specification.

<2. Using VTVM>

1. When using VTVM, connect multi connector with VTVM with SHAN-C12TCA.
   (Red : CH1, Black : CH2)
2. Follow the same procedure as **<1. Using Audio Precision>**.

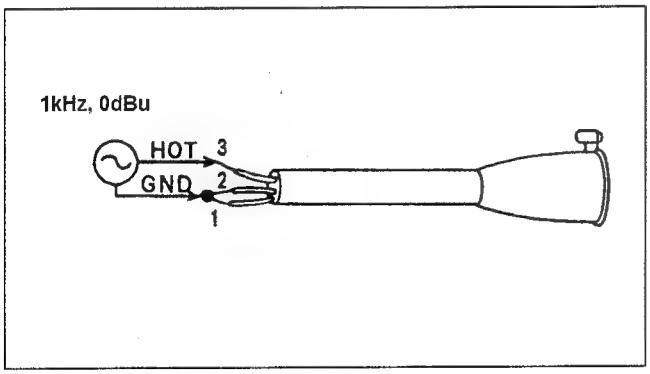
9-3. Recording Level Adjustment

BOARD	Audio LCD
SPEC.	-20dBu±0.2dB
TEST	Multi Connector (CH1, CH2)
ADJUST	VR102, VR202
INPUT	NTSC : 1kHz 4dBu Sine Wave PAL : 1kHz 0dBu Sine Wave
MODE	STOP
M.EQ	<1> Audio Precision, VFK1210 <2> VTVM, SHAN-C12TCA, CR Oscillator

SW Setting
AUDIO IN CH1 : REAR, LINE
AUDIO IN CH2 : REAR, LINE
AUDIO SELECT : MANUAL

<1. Using Audio Precision>
1. Connect multi connector with Audio Precision using VFK1210.
2. Set the AUDIO LEVEL VRs to center position.
3. Input the signal mentioned above to AUDIO IN CH1 connector.
4. Adjust the **VR102** so that the level of **CH 1** OUT (multi connector) is within specification.
5. Input the signal mentioned above to AUDIO IN CH2 connector.
6. Adjust the **VR202** so that the level of **CH 2** OUT (multi connector) is within specification.

<2. Using VTVM>
1. When using VTVM, connect multi connector with VTVM with SHAN-C12TCA.
   (Red : CH1, Black : CH2)
2. Follow the same procedure as **<1. Using Audio Precision>**.
3. Use the cable shown below to input signal.



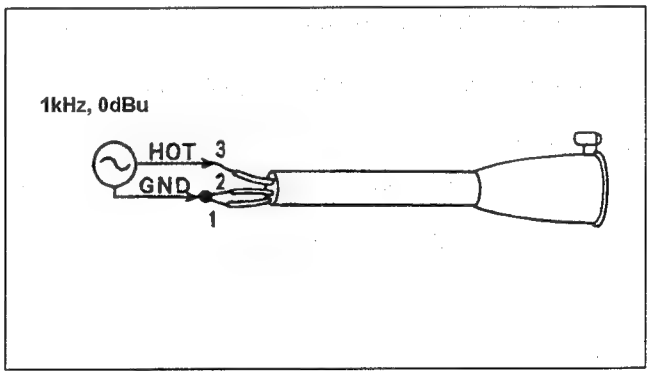
9-4. Meter Adjustment

BOARD	Audio LCD
SPEC.	NTSC : 0.63±0.005V PAL : 0.71±0.005V
TEST	TP102, TP202
ADJUST	VR103, VR203
INPUT	NTSC : 1kHz 4dBu Sine Wave PAL : 1kHz 0dBu Sine Wave
MODE	STOP
M.EQ	<1> Digital Volt Meter, Audio Precision <2> Digital Volt Meter, CR oscillator

SW Setting
AUDIO IN CH1 : REAR, LINE
AUDIO IN CH2 : REAR, LINE
AUDIO SELECT : MANUAL

<1. Using Audio Precision>
1. Input the signal mentioned above to AUDIO IN CH1 connector.
2. Adjust the **VR103** so that the DC voltage at the **TP102** is within specification.
3. Input the signal mentioned above to AUDIO IN CH2 connector.
4. Adjust the **VR203** so that the DC voltage at the **TP202** is within specification.
5. Confirm that the Audio Level Meter on LCD indicates one scale higher than **-20dB**.

<2. Using CR Oscillator>
1. Follow the same procedure as **<1. Using Audio Precision>**.



9-5. Test SG Adjustment

BOARD	Audio LCD
SPEC.	Distortion : 1.0±0.1% Level : -20dBu±0.5dB
TEST	Multi Connector (CH 1) (12P)
ADJUST	VR1, VR2
MODE	STOP
M.EQ	Frequency Counter <1> Audio Precision, VFK1210 <2> VTVM, SHAN-C12TCA, Distortion Meter

SW Setting

AUDIO IN CH1 : FRONT, MIC
AUDIO IN CH2 : REAR, LINE
AUDIO SELECT : MANUAL

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT] and [+] buttons, set MENU switch to SET position.
3. Set as follows:
   PAGE : FUNCTION 5/5
   TEST TONE : **ON**
4. After setting turn the menu OFF.

<1. Using Audio Precision>

1. Confirm that no signal is input.
2. Select **BARS** in OUTPUT SW and **FRONT MIC** in AUDIO IN SW CH1.
3. Confirm that 1kHz test signal is output.
4. Adjust the **VR1** so that the distortion is within specification.
5. Adjust the **VR2** so that the level is within specification.
6. After the adjustment, return TEST TONE to OFF.

<2. Using VTVM>

1. Follow the same procedure as **<1. Using Audio Precision>**.

9-6. CUE Recording Level Adjustment

BOARD	Audio LCD
SPEC.	-10dBu±0.2dB
TEST	TP501
ADJUST	VR501, SW701-2pin
INPUT	NTSC : 1kHz 4dBu Sine Wave PAL : 1kHz 0dBu Sine Wave
MODE	STOP
M.EQ	<1> Oscilloscope, Audio Precision <2> Oscilloscope, CR oscillator

SW Setting

AUDIO IN CH1 : REAR, LINE
AUDIO IN CH2 : REAR, LINE
AUDIO SELECT : MANUAL

<1. Using Audio Precision>

1. Input the signal mentioned above to AUDIO IN CH1 connector.
2. Set the 2nd pin of **SW701** to OFF and adjust the **VR501** so that the level is within specification.
3. After the adjustment, return the 2nd pin of **SW701** to ON.

<2. Using CR Oscillator>

1. Follow the same procedure as **<1. Using Audio Precision>**.

9-7. CUE Recording Current Adjustment

BOARD	Audio LCD
SPEC.	0±0.5V
TEST	TP505
ADJUST	VR1002 (Rear Jack Board), VR503
INPUT	1kHz 0dBu Sine Wave
MODE	PLAY, REC
TAPE	NTSC : VFM3580KM (No.1:0～14min) PAL : VFM3680KM (No.1:0～10min) Blank Tape
M.EQ	<1> Oscilloscope, Audio Precision <2> Oscilloscope, CR oscillator

SW Setting

AUDIO IN CH1 : REAR, LINE
AUDIO IN CH2 : REAR, LINE
AUDIO SELECT : MANUAL

<1. Using Audio Precision>

1. Confirm that the 2nd pin of **SW701** to OFF and input the signal mentioned above to AUDIO IN CH1 connector.
2. Playback the alignment tape and adjust the **VR503** so that the level at the **TP505** is **–12.0dBu±0.5dB**.
3. Record the signal.
4. Play back the recorded signal and adjust the **VR1002** on the Rear Jack Board so that the level difference from the level adjusted above is within specification. (**VR1002** is mounted on bottom side, below the flat cable connecting Audio LCD Board with Rear Jack Board.)
5. After the adjustment, return the 2nd pin of **SW701** to ON.

<2. Using CR Oscillator>

1. Follow the same procedure as **<1. Using Audio Precision>**.

9-8. Final Setting

Menu Setting

1. Open the operation panel.
2. Pressing [SHIFT], [+] and [-] buttons, set MENU switch to SET position.
3. Set as follows:

PAGE : MAIN FUNCTION
- PHANTOM FRONT : **ON**
- PHANTOM CH1 : OFF
- PHANTOM CH2 : OFF

PAGE : FUNCTION 4/5
- FRONT MIC : **-40dB**
- REAR MIC CH1 : -60dB
- REAR MIC CH2 : -60dB
- LINE CH1/CH2 : (NTSC) +4dB
  : (PAL) 0dB
- STEREO/MONO : STEREO
- MIC FILTER CH1 : OFF
- MIC FILTER CH2 : OFF
- EMPHASIS : OFF

PAGE : FUNCTION 5/5
- AUDIO OUT SEL : CH1
- LIMITER : **ON**
- TEST SIGNAL : **ON**

4. After setting turn the menu OFF.

10. Power

10-1. D3.0V Adjustment

BOARD	Power, VIDEO MAIN
SPEC.	3.15V+0.05V/-0.00V
TEST	TP9[3.15],TP6[A-GND] (VIDEO MAIN Board)
ADJUST	VR1005(POWER Board)
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

1. Connect a D.V.M. to **TP9**, and its ground to **TP6** on the VIDEO MAIN Board, then adjust **VR1005** (POWER Board) so that the voltage is in the specification.

10-2. D5.0V Adjustment

BOARD	Power
SPEC.	5.00V+/-0.10V
TEST	TP1010,TG1002[GND]
ADJUST	VR1006
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

1. Connect a D.V.M. to **TP1010**, and its ground to **TG1002** on the POWER Board, then adjust **VR1006** (POWER Board) so that the voltage is in the specification.

10-3. A5.6V Adjustment

BOARD	Power
SPEC.	5.60V+/-0.10V
TEST	TP1008,TG1002[GND]
ADJUST	VR1004
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

1. Connect a D.V.M. to **TP1008**, and its ground to **TG1002** on the POWER Board, then adjust **VR1004** (POWER Board) so that the voltage is in the specification.

10-4. A9.0V Adjustment

BOARD	Power
SPEC.	9.00V+/-0.10V
TEST	TP1007,TG1002[GND]
ADJUST	VR1003
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

1. Connect a D.V.M. to **TP1007**, and its ground to **TG1002** on the POWER Board, then adjust **VR1003** (POWER Board) so that the voltage is in the specification.

10-5. A–5.6V Adjustment

BOARD	Power
SPEC.	-5.60V+/-0.10V
TEST	TP1003,TG1002[GND]
ADJUST	VR1001
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

1. Connect a D.V.M. to **TP1003**, and its ground to **TG1002** on the POWER Board, then adjust **VR1001** (POWER Board) so that the voltage is in the specification.

10-6. A3.6V Adjustment

BOARD	Power
SPEC.	3.60V+/-0.10V
TEST	TP1011,TG1002[GND]
ADJUST	VR1002
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

1. Connect a D.V.M. to **TP1011**, and its ground to **TG1002** on the POWER Board, then adjust **VR1002** (POWER Board) so that the voltage is in the specification.

10-7. CCD17.0V Confirmation

BOARD	Power
SPEC.	17.40V+/-0.40V
TEST	TP1005,TG1002[GND]
ADJUST	------
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

1. Connect a D.V.M. to **TP1005**, and its ground to **TG1002** on the POWER Board, then confirm that the voltage is in the specification.
2. If it is not in the specification, adjust **VR1002** (11-6 A3.6V Adjustment) so that the voltage is in the specification.

10-8. CCD-11.0V Confirmation

BOARD	Power
SPEC.	-11.50V+/-0.40V
TEST	TP1006,TG1002[GND]
ADJUST	------
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

1. Connect a D.V.M. to **TP1006**, and its ground to **TG1002** on the POWER Board, then confirm that the voltage is in the specification.
2. If it is not in the specification, adjust **VR1002** (11-6 A3.6V Adjustment) so that the voltage is in the specification.

10-9. A-3.9V Confirmation

BOARD	Power
SPEC.	-3.90V+/-0.30V
TEST	TP1012,TG1002[GND]
ADJUST	------
INPUT	CAMERA Colour Bar
MODE	REC
M.EQ	Digital Volt Meter

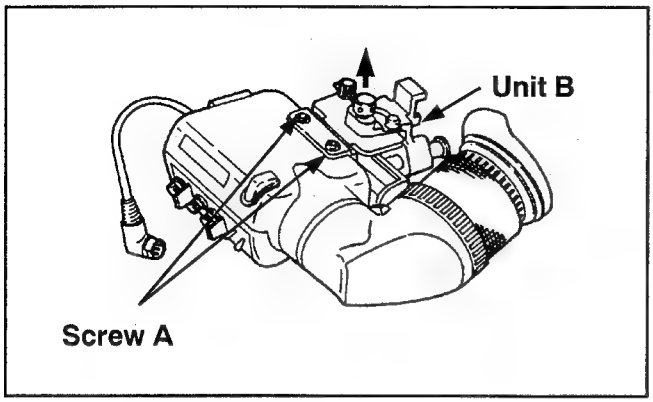
1. Connect a D.V.M. to **TP1012**, and its ground to **TG1002** on the POWER Board, then confirm that the voltage is in the specification.
2. If it is not in the specification, adjust **VR1002** (11-6 A3.6V Adjustment) so that the voltage is in the specification.

<MEMO>

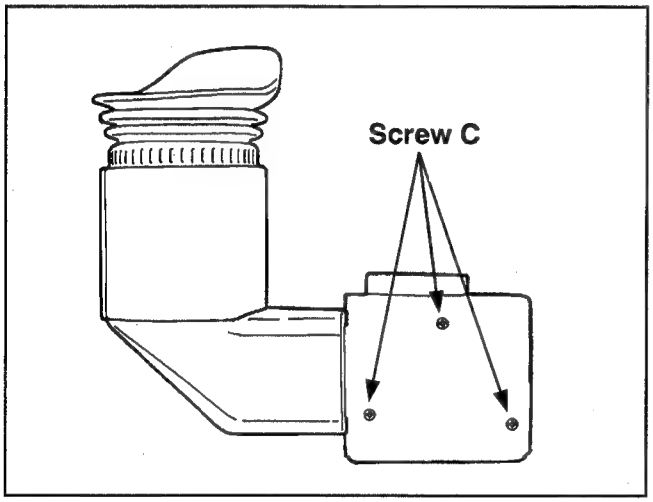
11. EVF (ADJ-700 only)

Preparation

1. Remove two **screws A** to pull off the unit B.



2. Remove three **screws C** at bottom side.
3. Open bottom case.
4. Connect EVF cable with AJ-D700.



11-1. H Free Run Adjustment

BOARD	VIDEO
SPEC.	15.75±0.1kHz (NTSC) 15.625±0.1kHz (PAL)
TEST	TP9102 (H Def Board)
ADJUST	VR9001
M.EQ	Frequency Counter

1. Adjust the **VR9001** so that the frequency at the **TP9102** is within specification without input signal.

11-2. V Free Run Adjustment

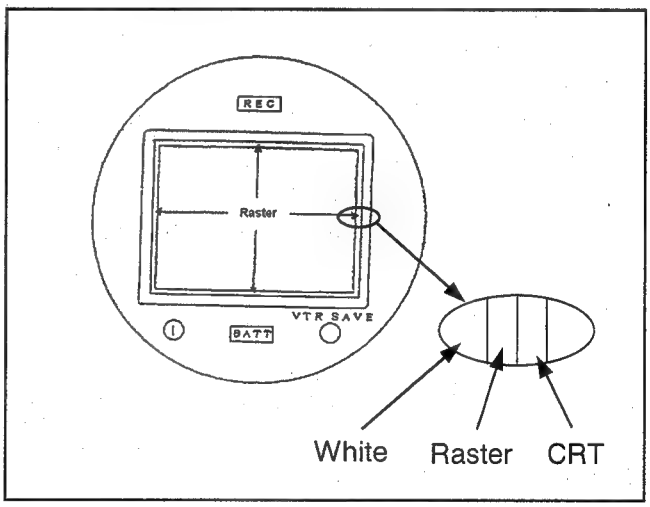
BOARD	VIDEO
SPEC.	54±0.5Hz (NTSC) 46±0.5Hz (PAL)
TEST	TP9002
ADJUST	VR9002
M.EQ	Frequency Counter

1. Adjust the **VR9002** so that the frequency at the **TP9002** is within specification without input signal.

11-3. Sub Bright Adjustment

BOARD	H Def
TEST	EVF Picture
ADJUST	VR9103
SUBJECT	90% White

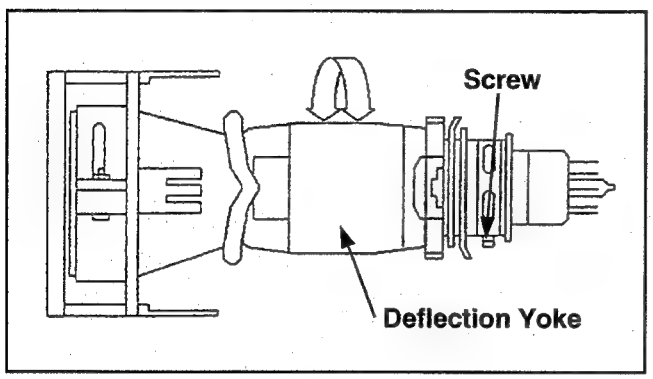
1. Set BRIGHT VR to MAX, CONTRAST VR to MAX and PEAKING VR to MIN.
2. Adjust the **VR9103** so that raster slightly appears.

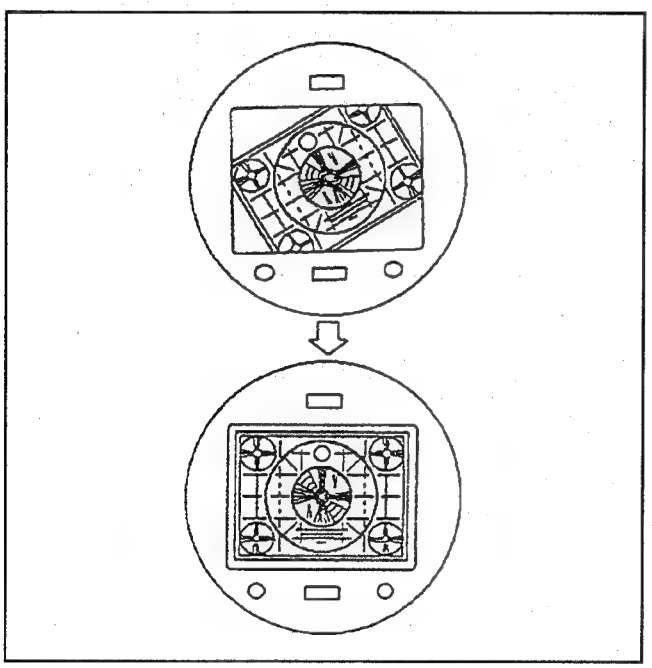


11-4. Rotation Adjustment

TEST	EVF Picture
ADJUST	Deflection Yoke
SUBJECT	Registration Chart

1. Loosen the screw and rotate Deflection Yoke so that the picture stands horizontally.
2. Tighten the screw again.

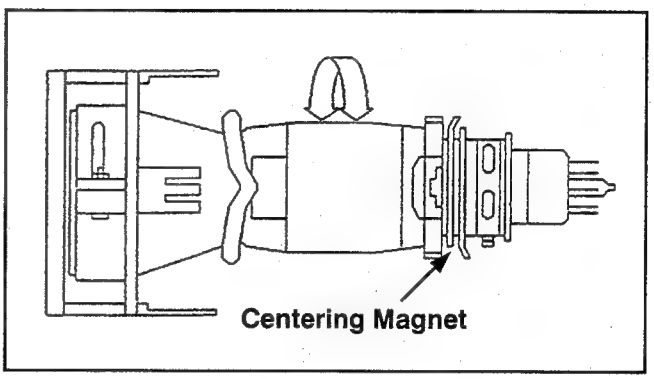


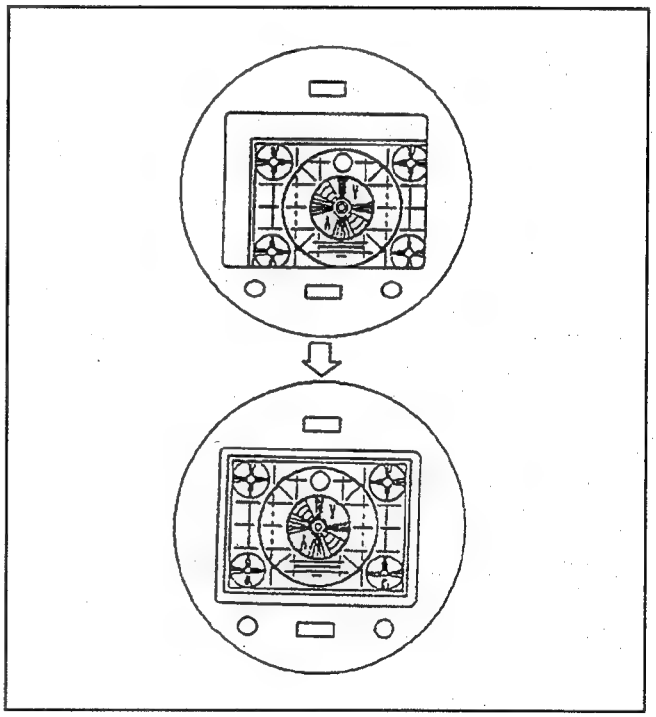


11-5. Centering Adjustment

BOARD	H Def
TEST	EVF Picture
ADJUST	Centering Magnet
SUBJECT	Registration Chart

1. Set BRIGHT VR to MAX, CONTRAST VR to MAX and PEAKING VR to MIN.
2. Rotate Centering Magnet so that the picture stands at the center.

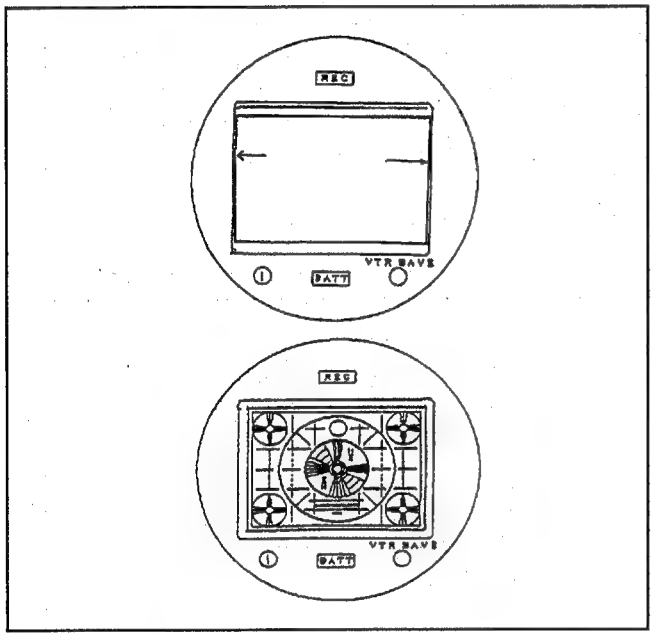




11-6. Size Adjustment

BOARD	H Def, VIDEO
TEST	EVF Picture
ADJUST	VR9101(H DEF), VR9003(VIDEO)
SUBJECT	Registration Chart

1. Set BRIGHT VR to MAX, CONTRAST VR to MAX and PEAKING VR to MIN.
2. Adjust the **VR9101** so that the picture is maximized.
3. Repeat Rotation and Centering adjustments slightly in case of need.
4. Adjust the **VR9003** so that the circle of chart is most round.



11-7. V Linearity Adjustment

BOARD	VIDEO
TEST	EVF Picture
ADJUST	VR9004
SUBJECT	Registration Chart

1. Adjust the **VR9004** so that the circle of chart is most round.

11-8. Balance Adjustment

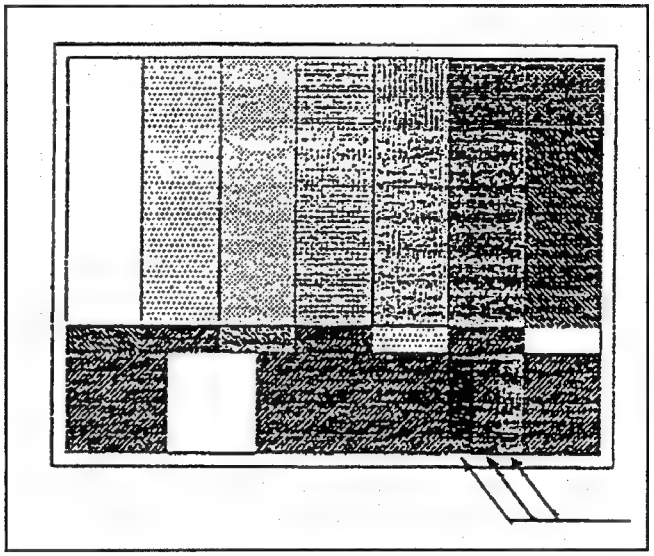
TEST	EVF Picture
ADJUST	Deflection Yoke Centering Magnet VR9003, VR9004
SUBJECT	Registration Chart

1. Fine-adjust Rotation, Centering, Size (Vertical) and V Linearity.

11-9. Bright Adjustment

BOARD	VR.SW
TEST	EVF Picture
ADJUST	VR9301
SUBJECT	Color Bar (SMPTE)

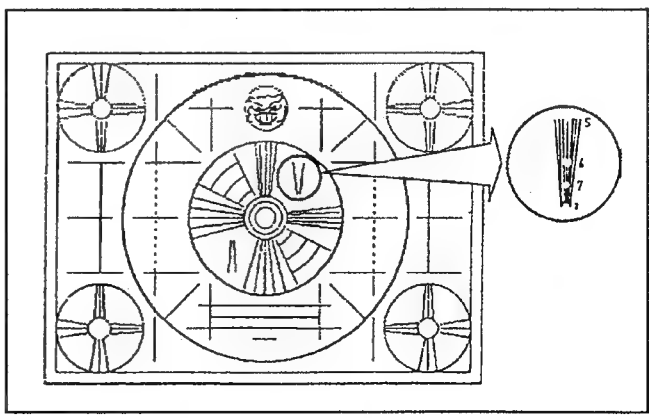
1. Set CONTRAST VR to MAX and PEAKING VR to MIN.
2. Monitor the three regions indicated by arrow.
3. Adjust the **VR9301** so that the right region is slightly lighted and other two is black.



10-11. Focus Adjustment

BOARD	H DEF
TEST	EVF Picture
ADJUST	VR9102
SUBJECT	Registration Chart

1. Set CONTRAST VR to MAX and PEAKING VR to MIN.
2. Adjust the **VR9102** so that resolution is best.



SECTION 5

BLOCK DIAGRAMS

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PULSE BLOCK DIAGRAM BLK-3
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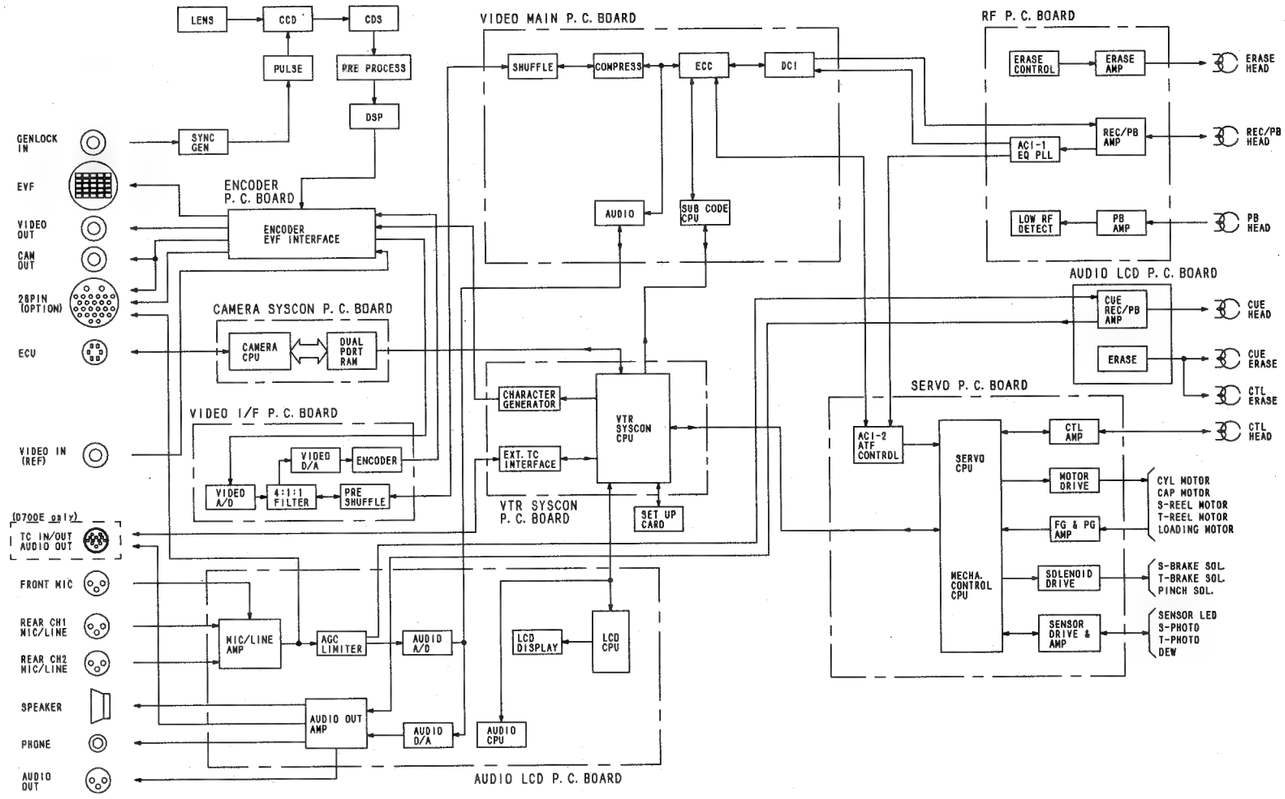
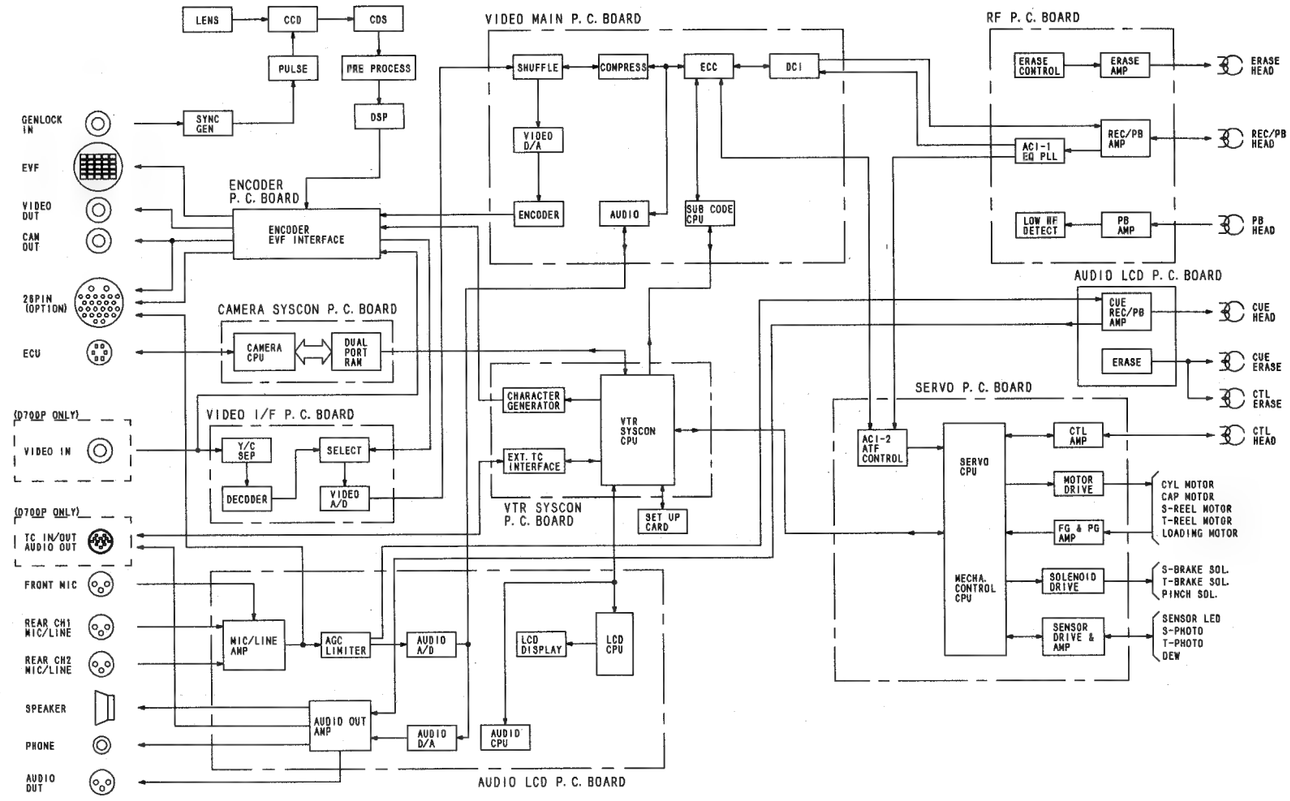
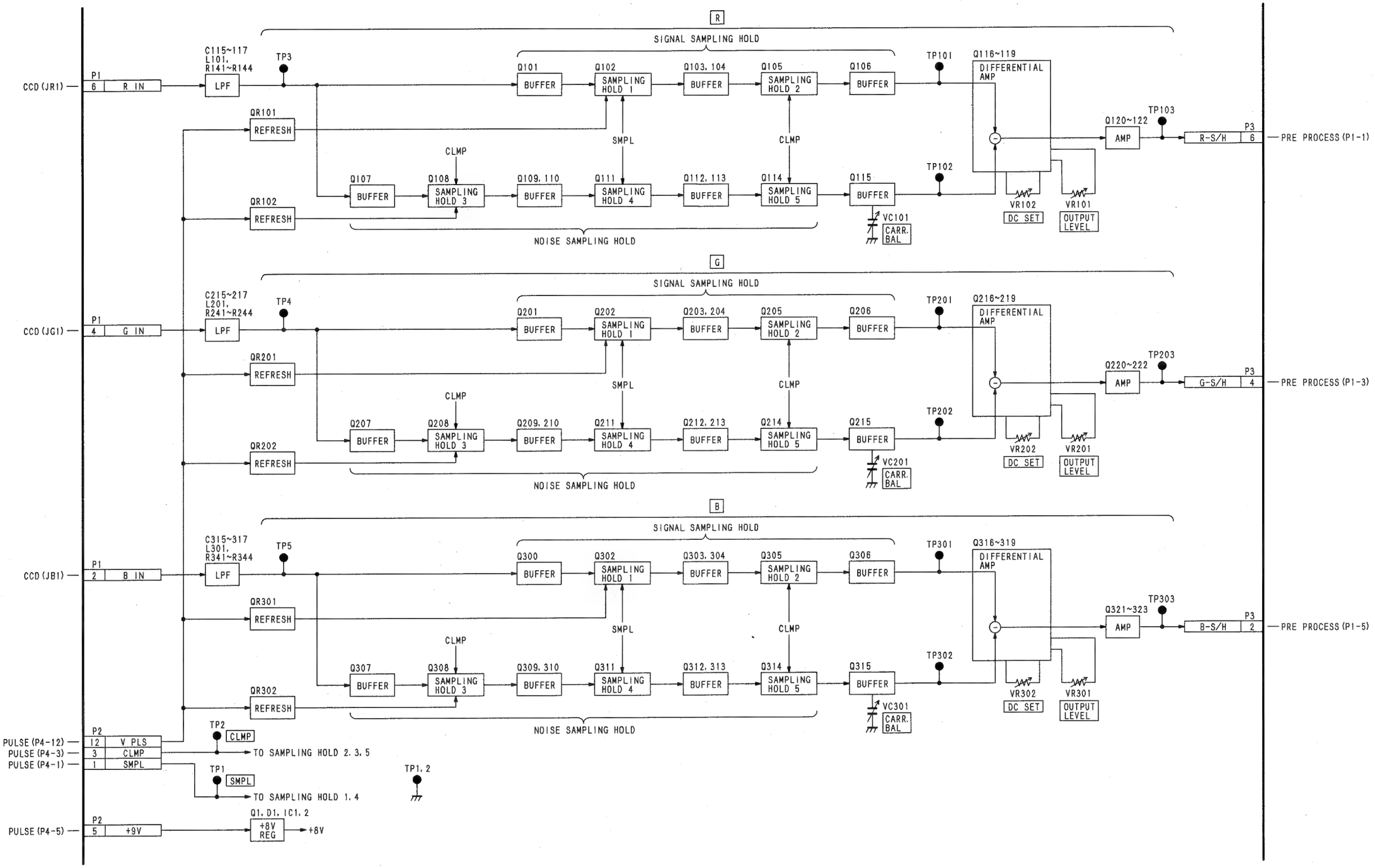
OVERALL BLOCK DIAGRAM (PAL)



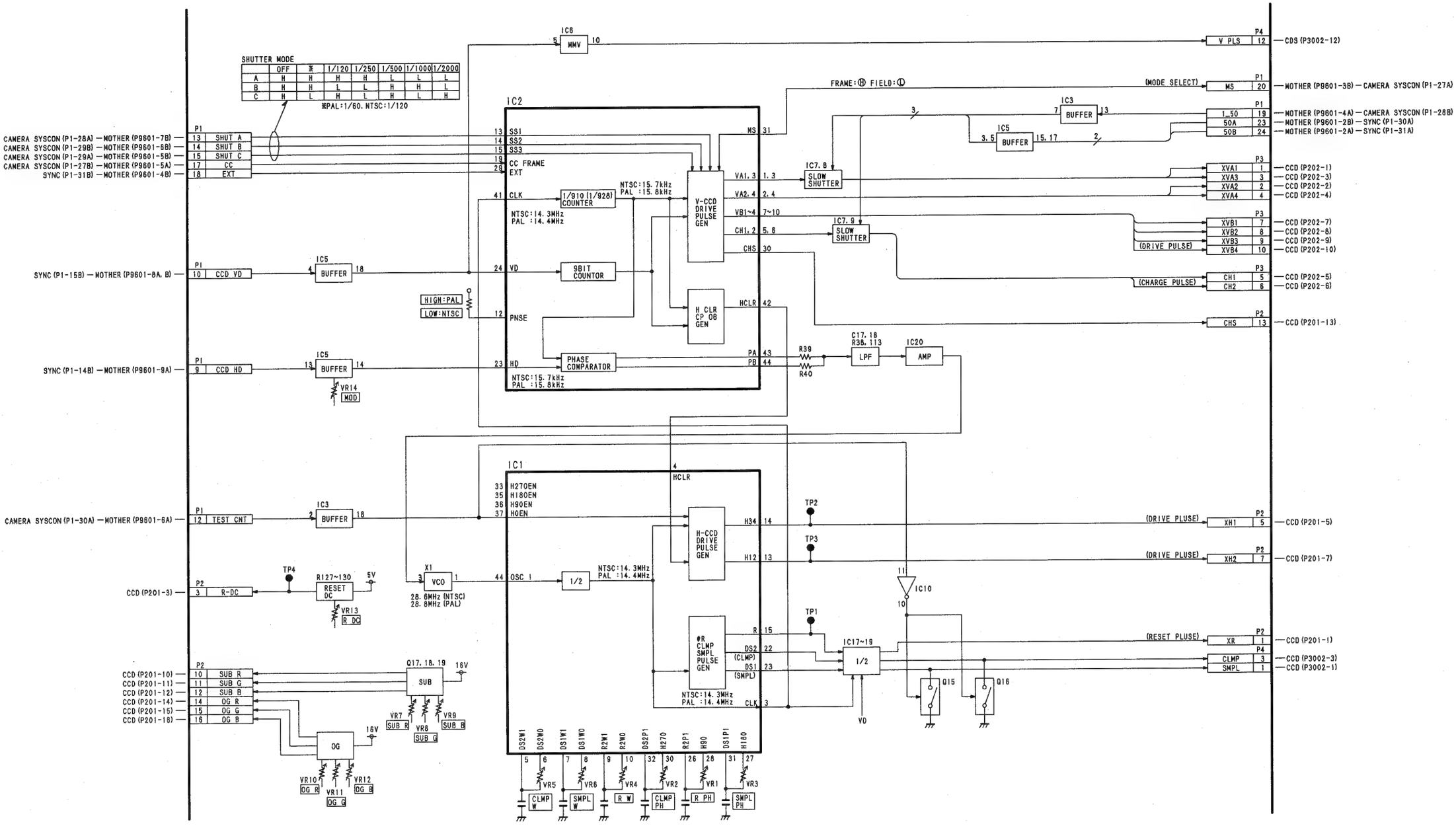
OVERALL BLOCK DIAGRAM (NTSC)



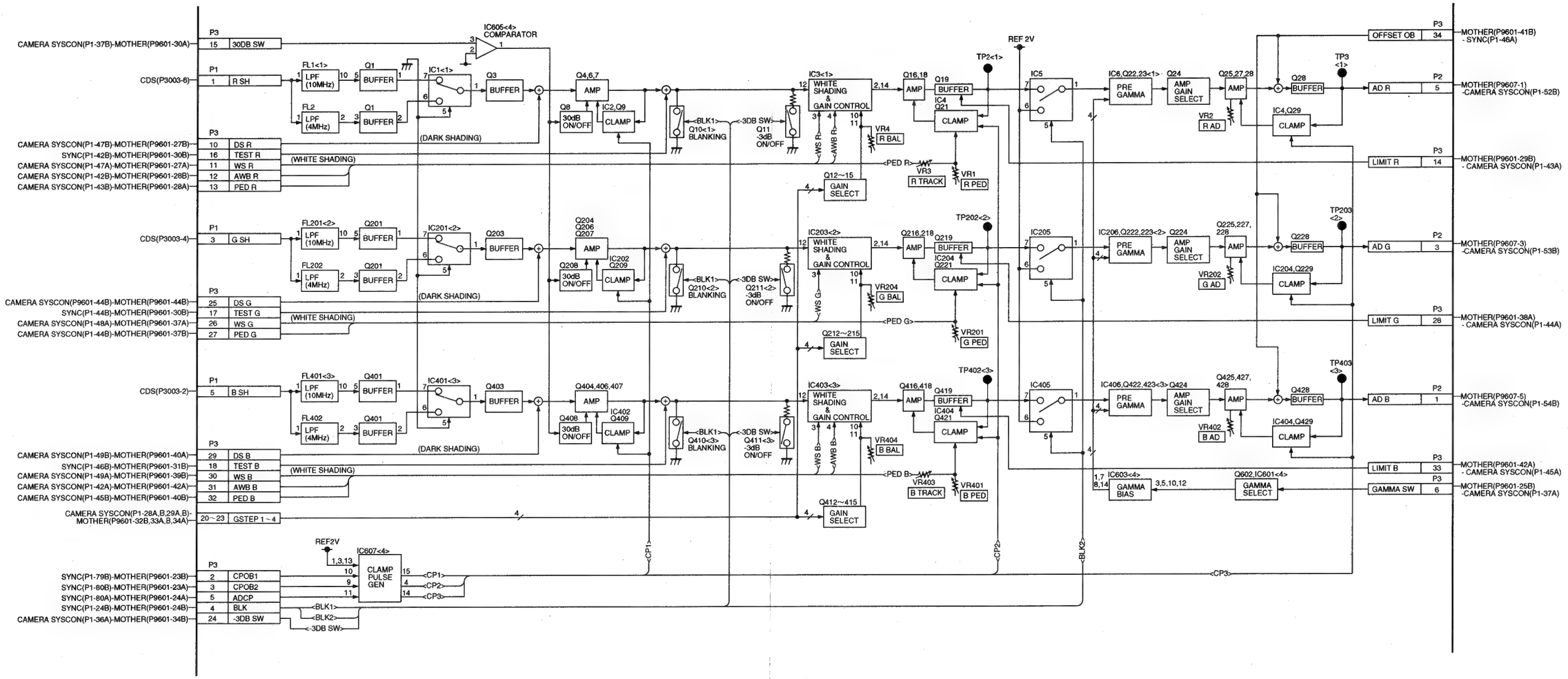
CDS BLOCK DIAGRAM



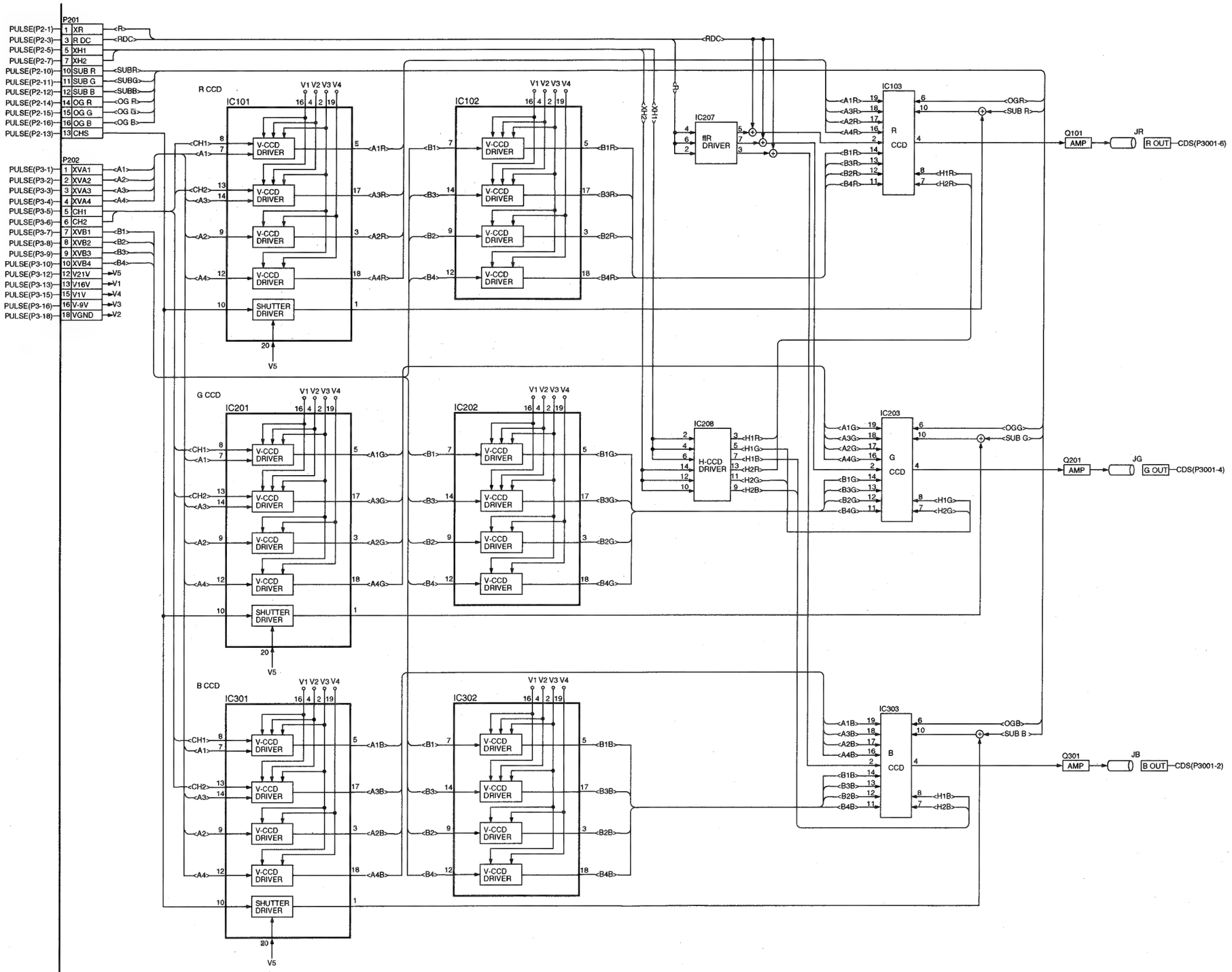
PULSE BLOCK DIAGRAM



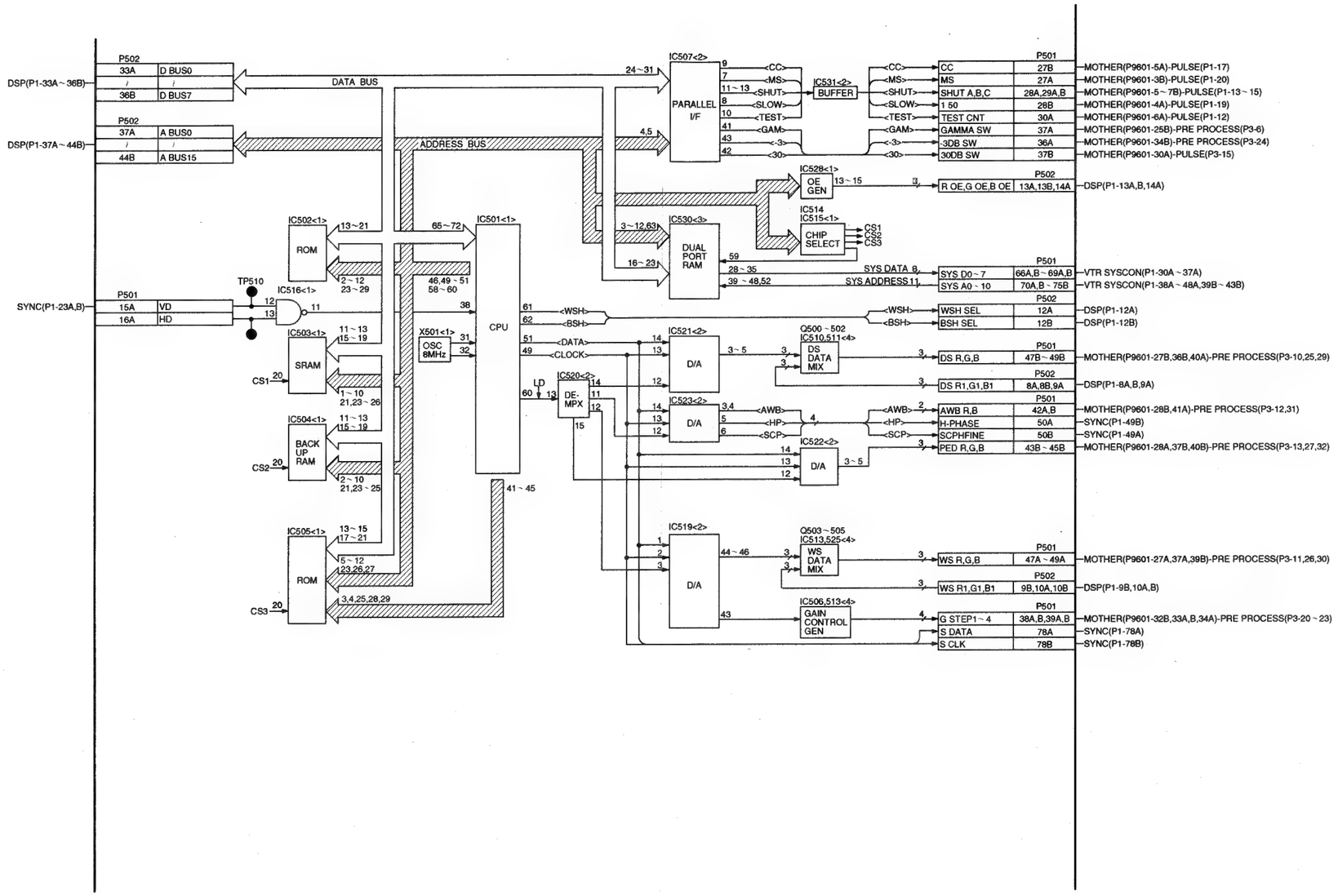
PRE PROCESS BLOCK DIAGRAM



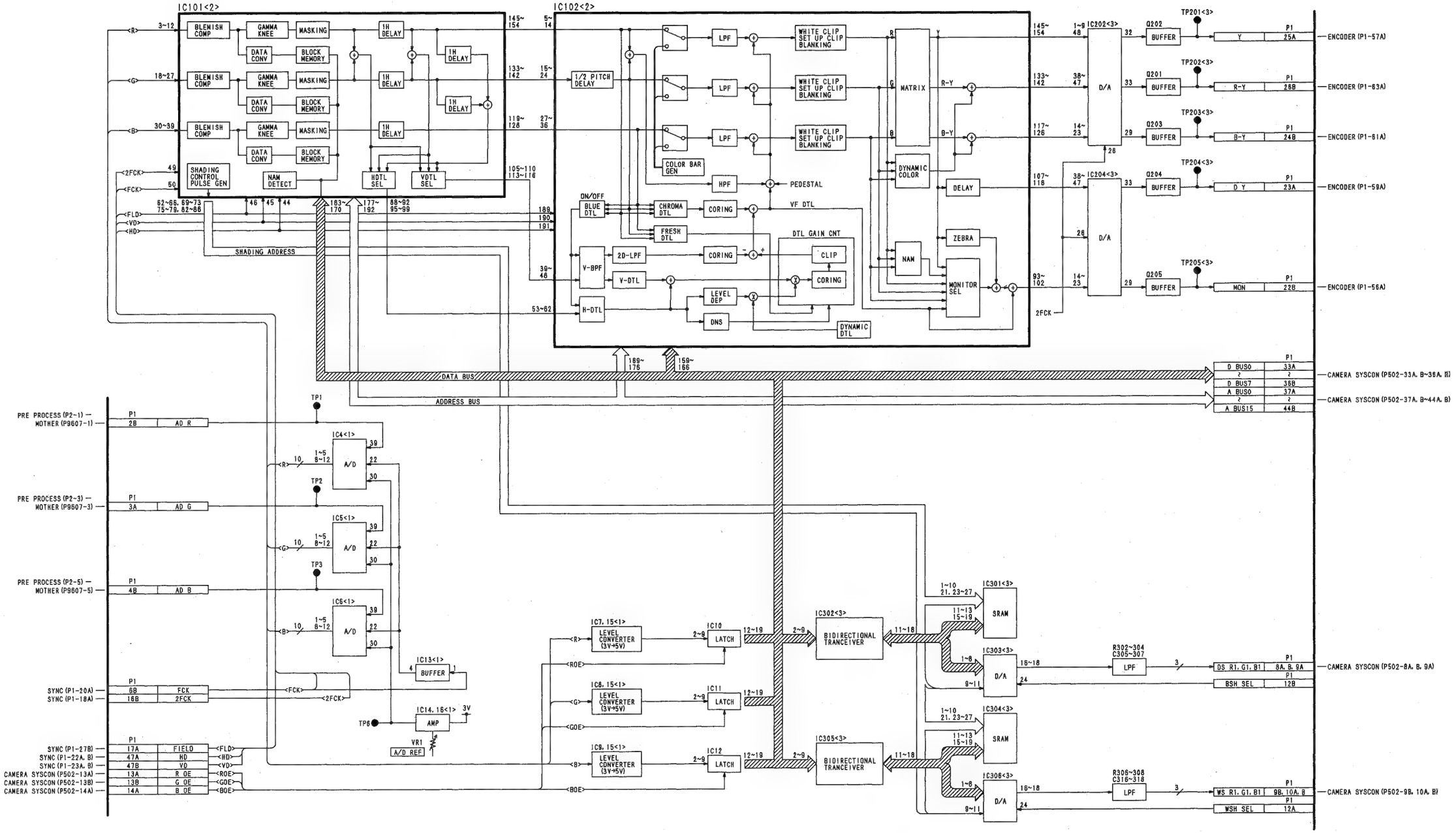
CCD BLOCK DIAGRAM



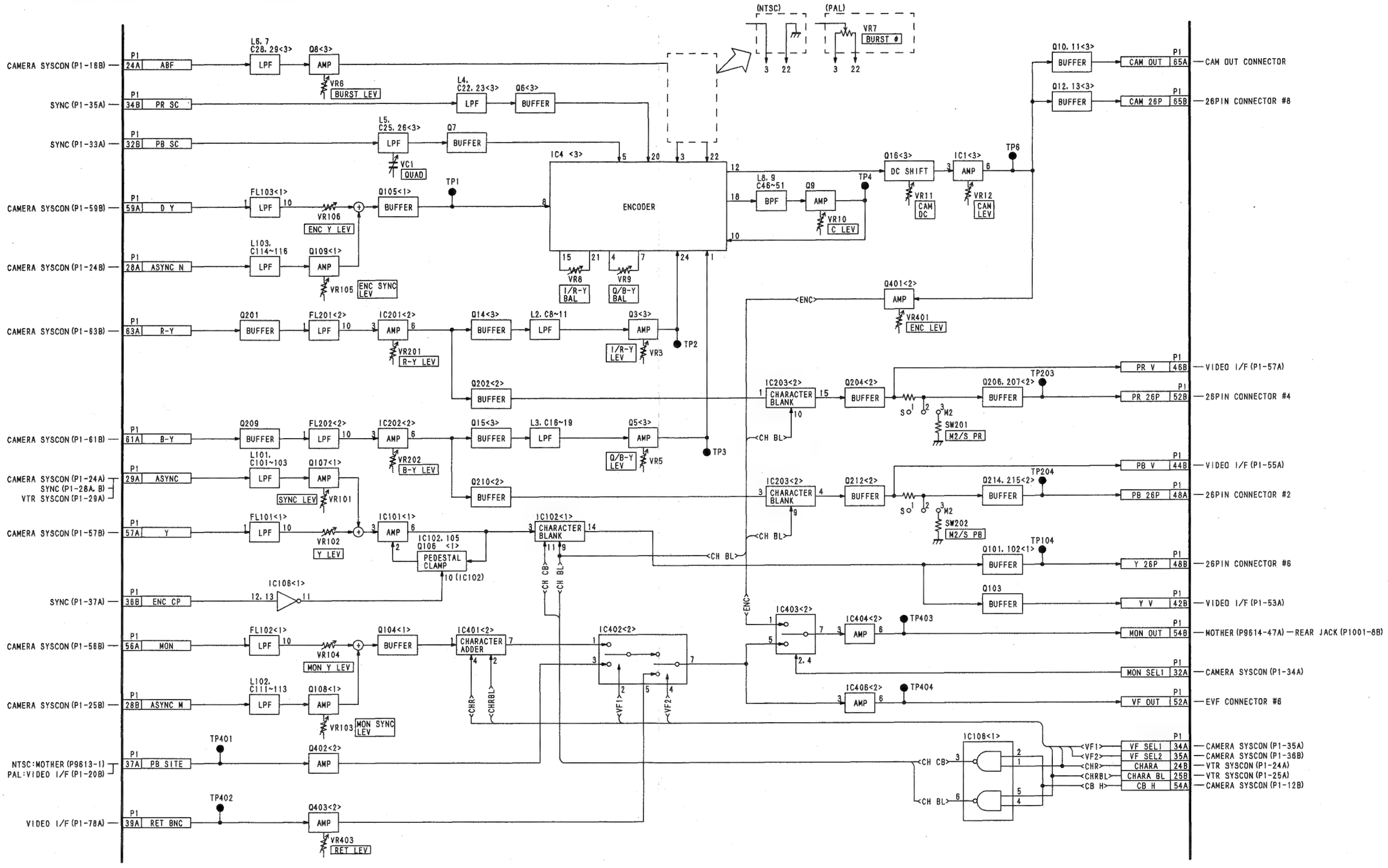
CAMERA SYSCON BLOCK DIAGRAM



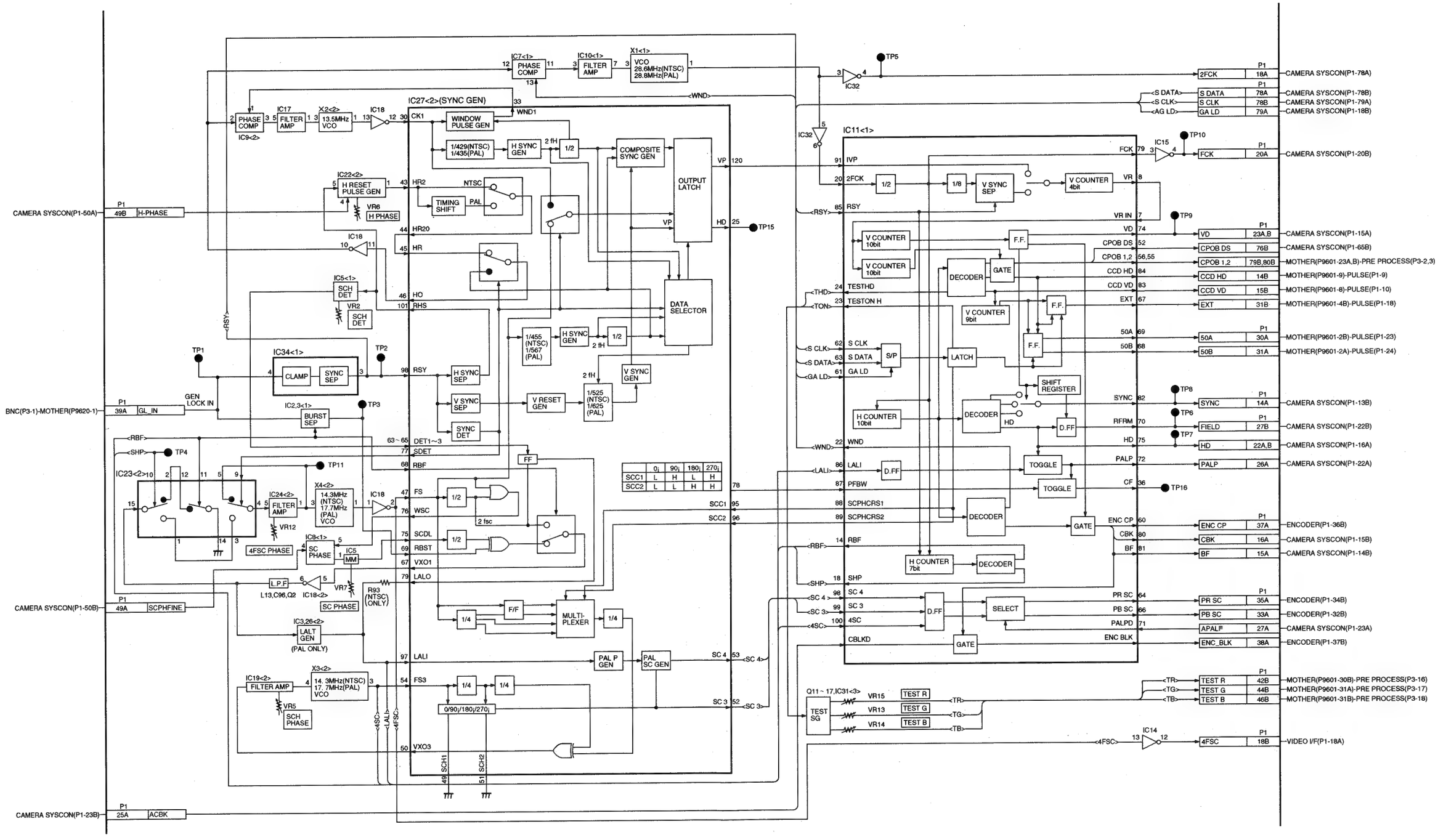
DSP BLOCK DIAGRAM



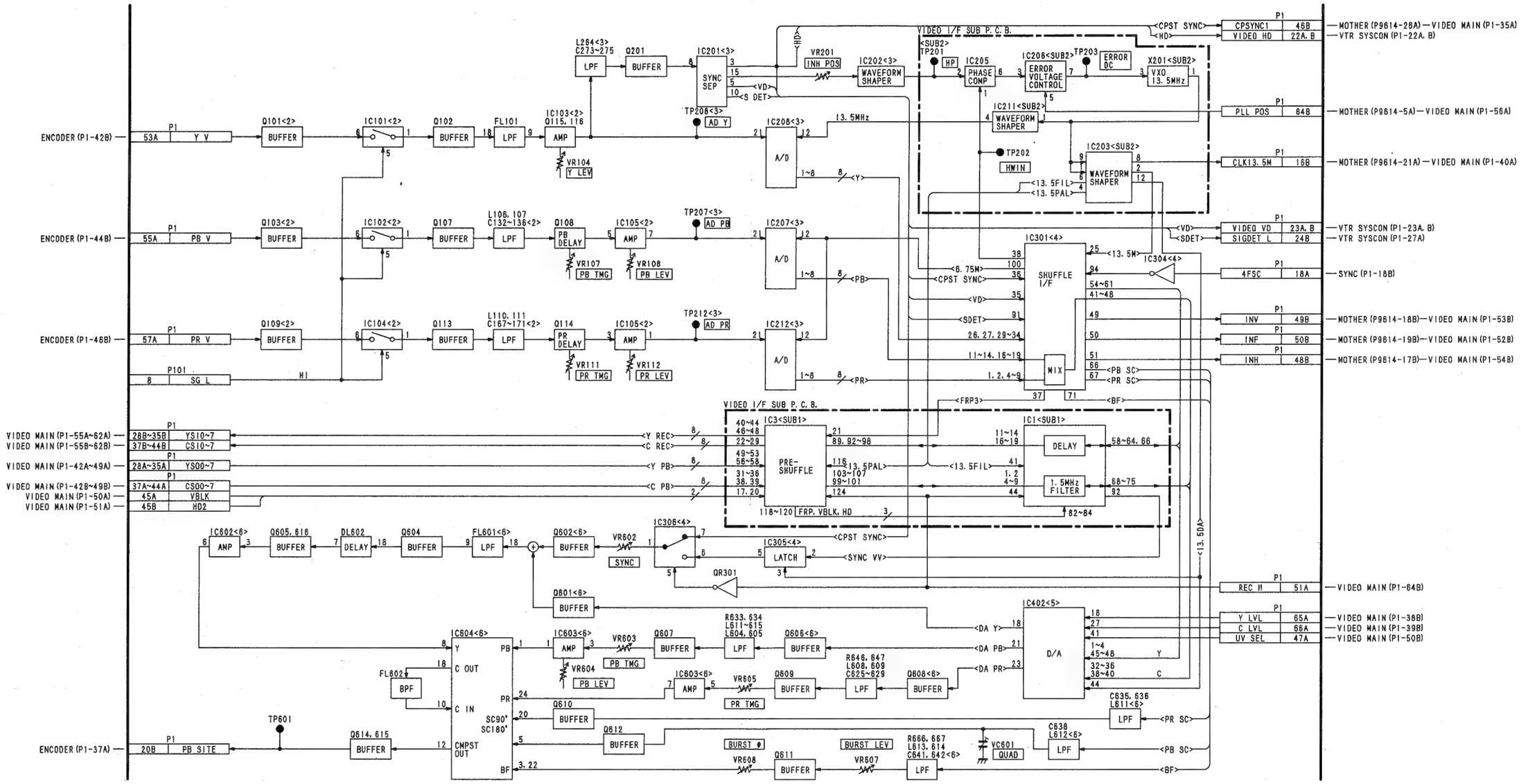
ENCODER BLOCK DIAGRAM



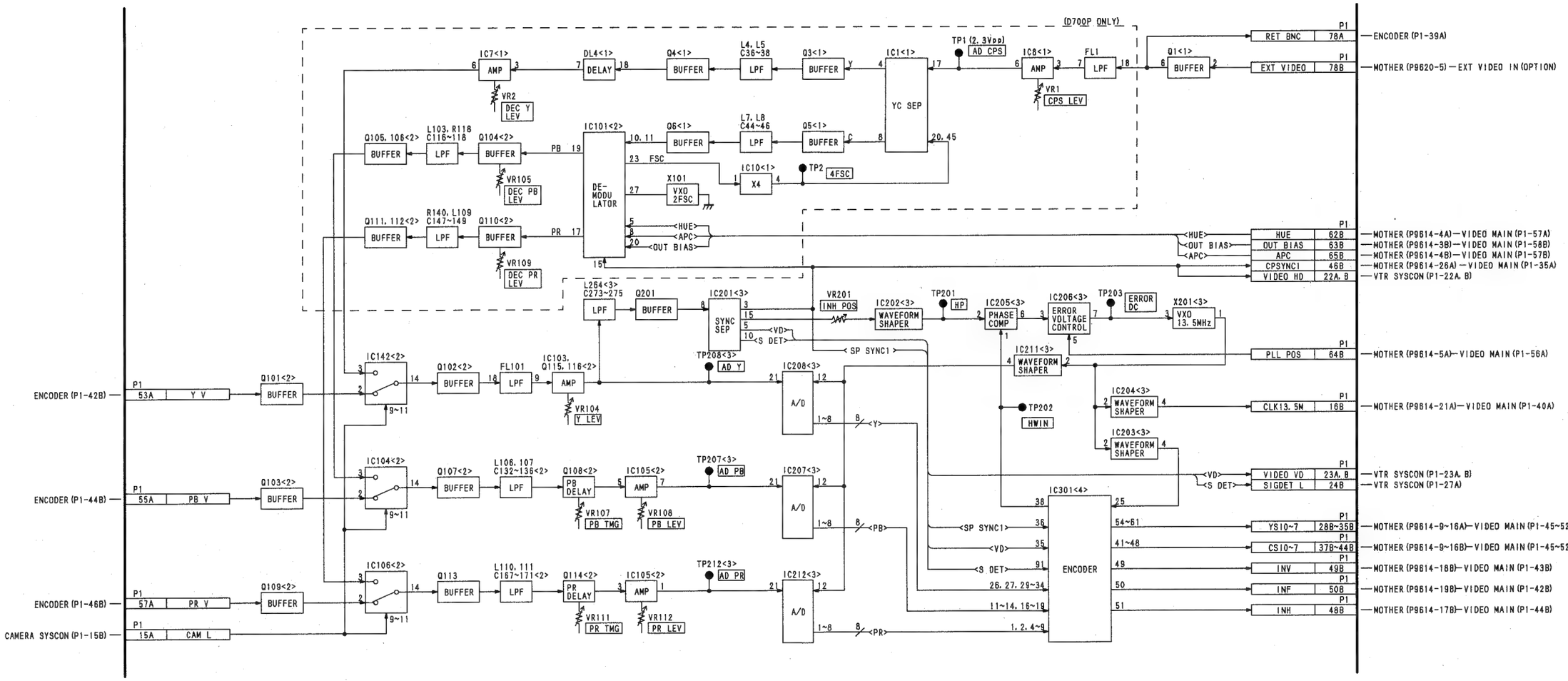
CAMERA SYNC BLOCK DIAGRAM



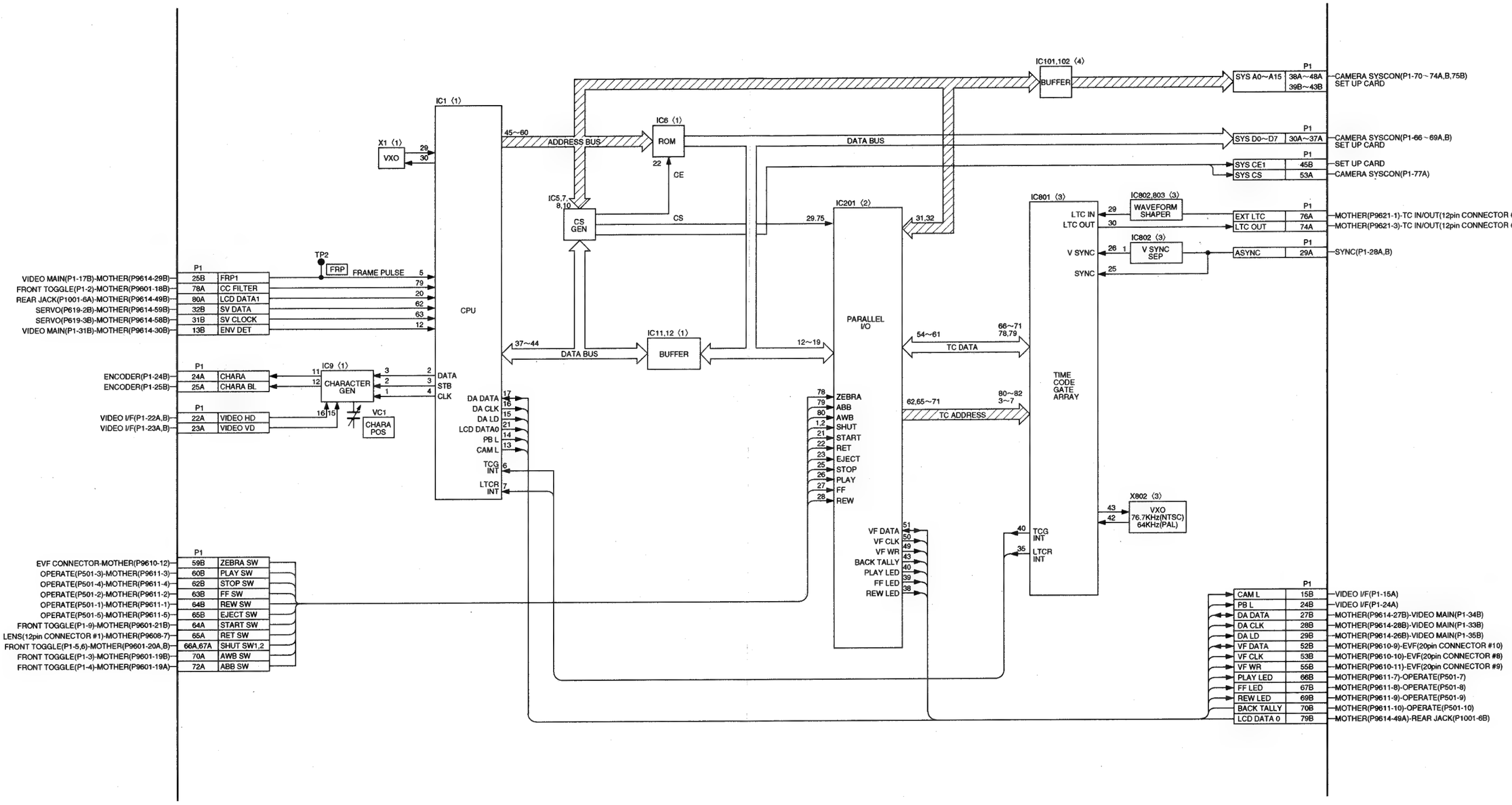
VIDEO I/F BLOCK DIAGRAM (PAL)



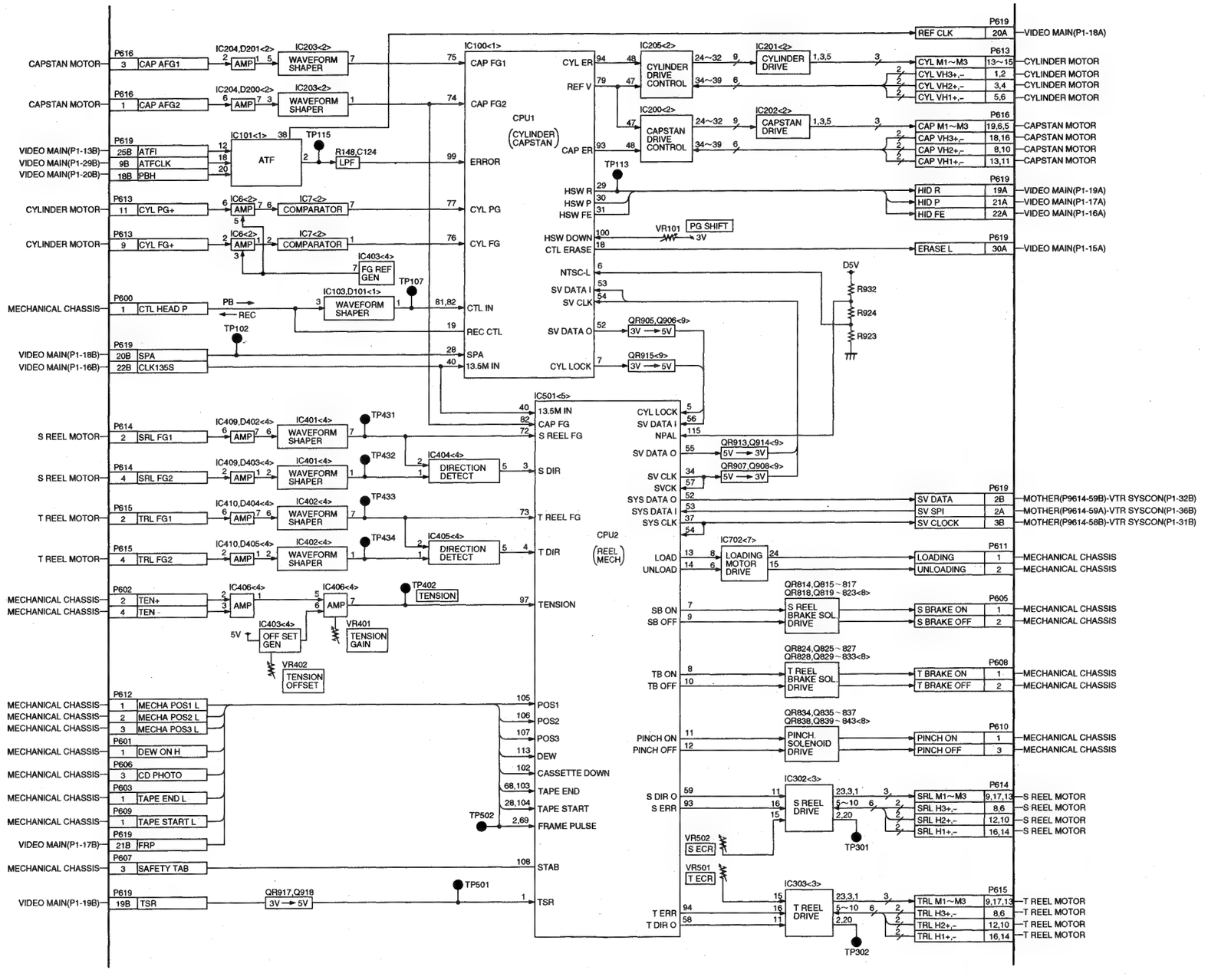
VIDEO I/F BLOCK DIAGRAM (NTSC)



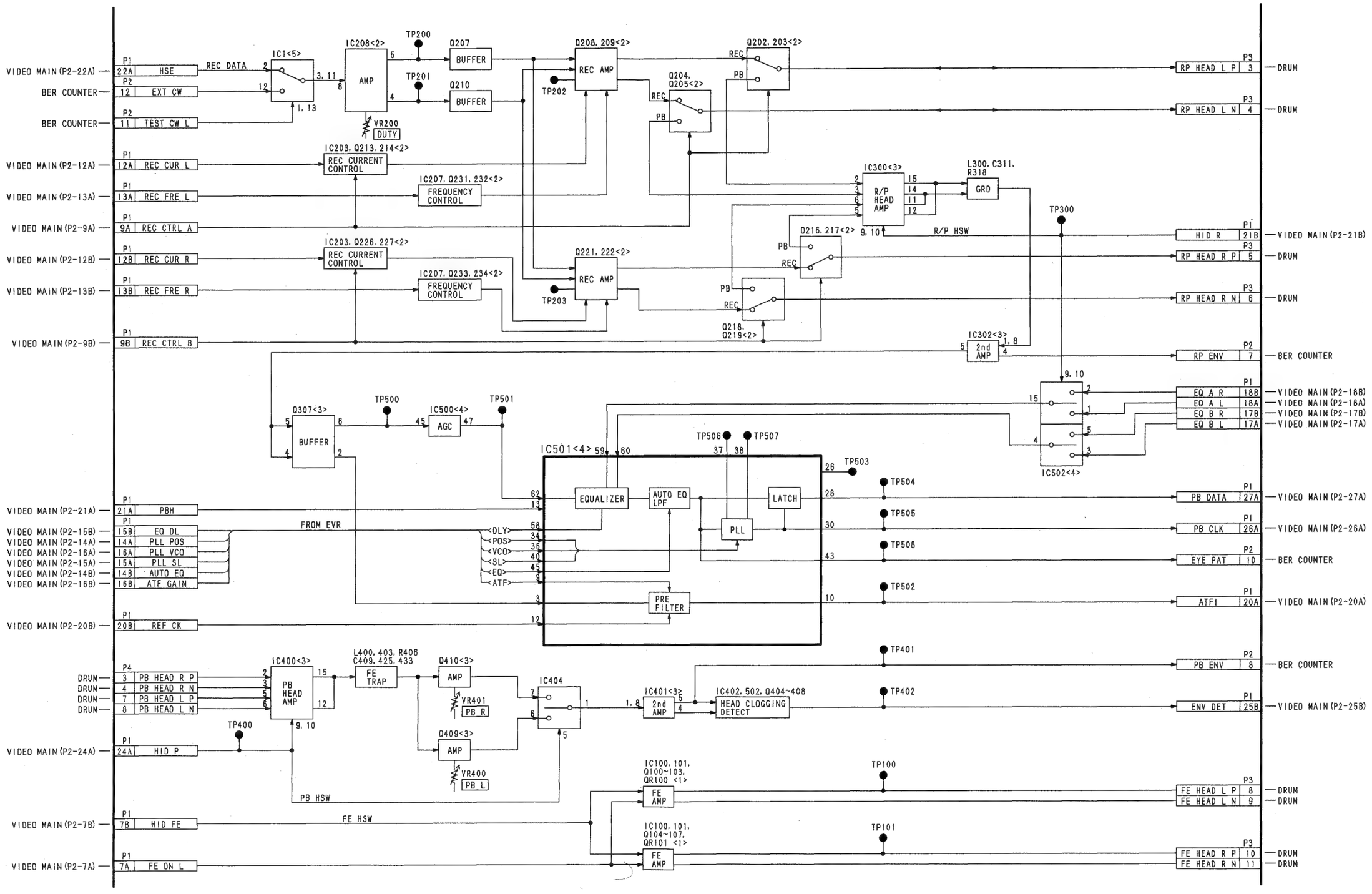
VTR SYSCON BLOCK DIAGRAM



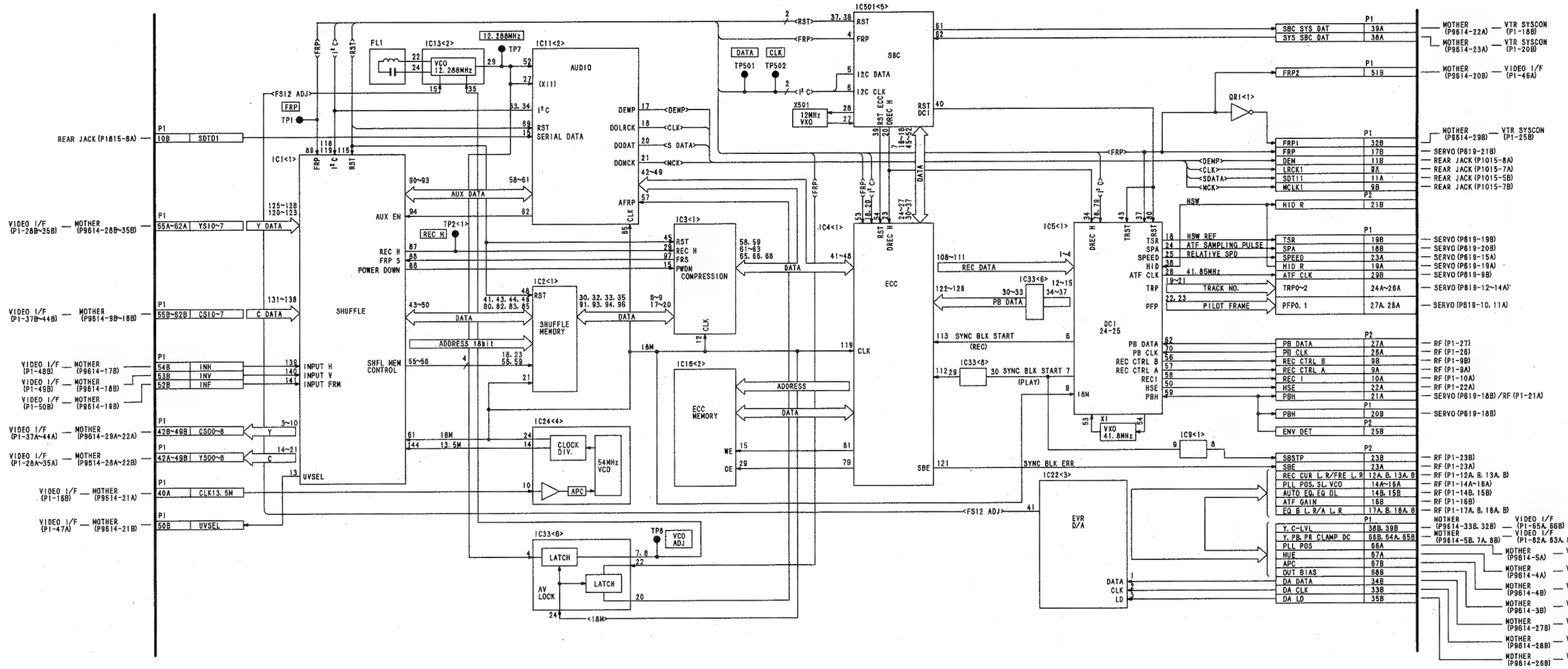
SERVO BLOCK DIAGRAM



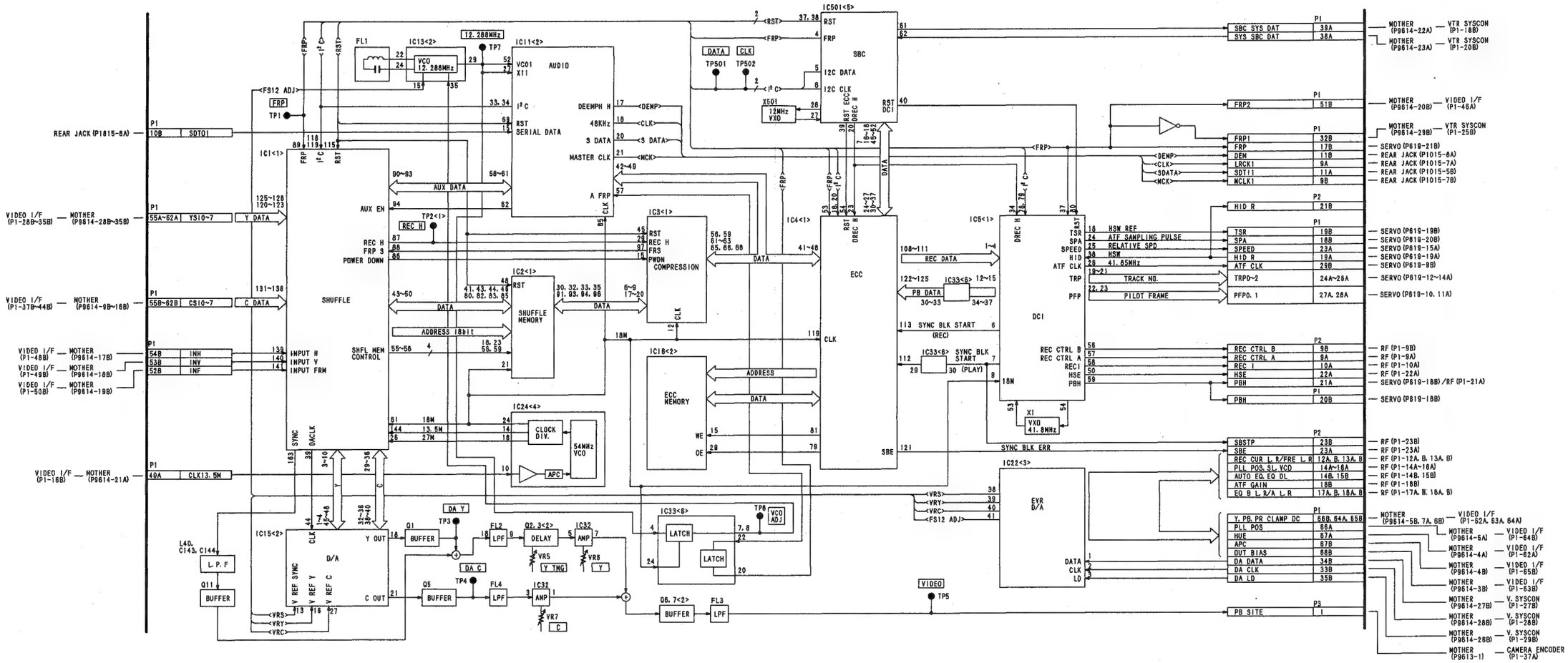
RF BLOCK DIAGRAM



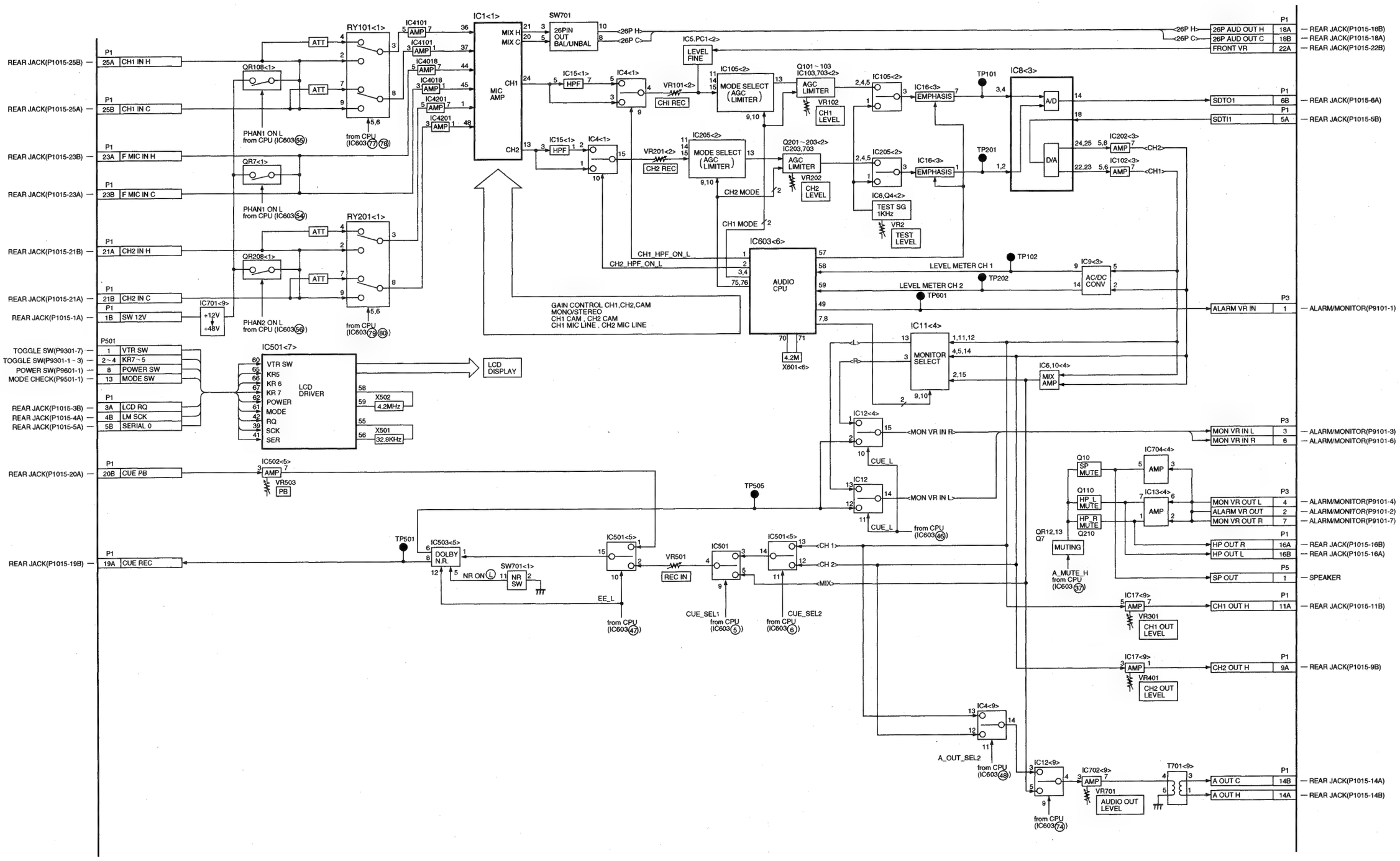
VIDEO MAIN BLOCK DIAGRAM (PAL)



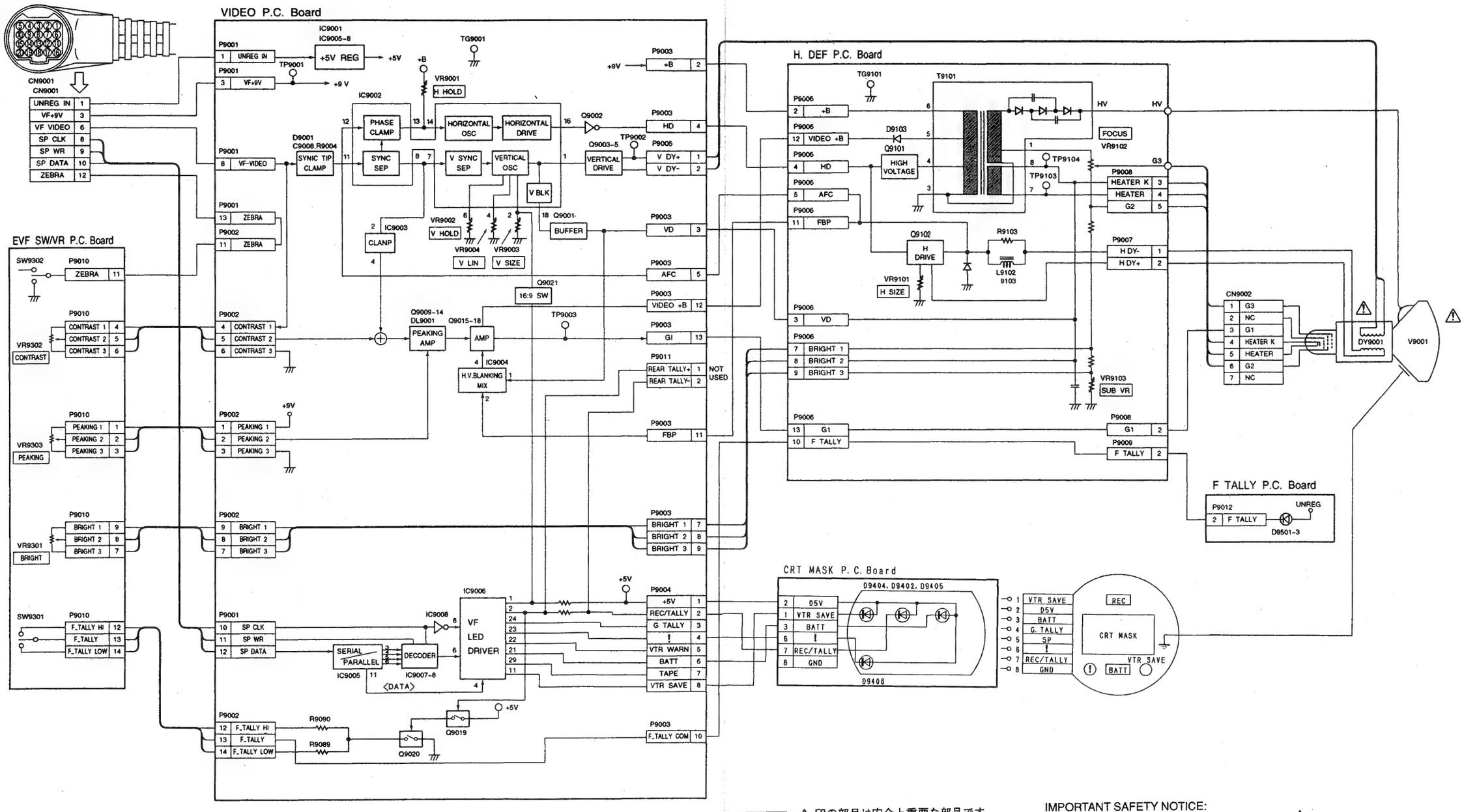
VIDEO MAIN BLOCK DIAGRAM (NTSC)



AUDIO LCD BLOCK DIAGRAM



EVF BLOCK DIAGRAM (AJ-D700 ONLY)



⚠警告 ⚠ 印の部品は安全上重要な部品です。交換するときは、安全及び性能維持のため必ず指定の部品をご使用ください。

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

AJ-D800AE Additional Information

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Specifications

General

Power supply voltage:	12 V DC
Power consumption:	22 W

Operating temperature:	0°C to 40°C
Storage temperature:	−20°C to 60°C
Operating humidity:	Less than 85% (relative humidity)
Continuous operating time:	Approx. 90 min. (using 1 Anton Bauer Trimpac 14 battery)
Weight:	Approx. 5.85 kg (includ. main unit, viewfinder, lens, battery pack, tape and microphone)
Dimensions:	119.2 (W)×255.5 (includ. handle) (H)×326.3 (D) mm

Camera Section

Pick-up devices:	2/3-inch on-chip IT type of CCD
System:	RGB 3-CCD system
Picture elements:	480,000 pixel
Spectral system:	F1.4 prism system
Built-in filters:	1; 3200K 2; 5600K+1/4 ND 3; 5600K 4; 5600K+1/16 ND
Quantization:	10-bit A/D (R, G and B channels), 14.5 MHz
Digital signal processing:	16-bit long operation, 14.5 MHz/29.0 MHz
Horizontal drive frequency:	14.5 MHz
Programmable gains:	3 positions can be set from among −3, 0, 3, 6, 9, 12, 15, 18, 21, 24 and 30 dB.
Super gain:	30 dB
Shutter speeds:	1/60, 1/120, 1/250, 1/500, 1/1000 and 1/2000 sec. Synchro scan mode; 1/50.5–1/252 sec.
Lens mount:	2/3″ Bayonet type
Sensitivity:	F8 (2000 lux, 89.9% reflection)
Minimum subject brightness:	2 lux (F1.4, +30 dB)
Image S/N ratio:	60 dB (typical)
Horizontal resolution:	750 lines (centre)
Vertical resolution:	450 lines/more than 500 lines (Super V mode)
Sampling frequency:	14.4 MHz/28.8 MHz
Registration:	Below 0.03% (entire range) (excld. lens)
Geometric distortion:	Below measurable limit (excld. lens)

Viewfinder (option, AJ-VF10E)

CRT:	1.5″ monochrome
Horizontal resolution:	600 lines (centre)
Controls/Switches:	Controls; BRIGHT, CONTRAST, PEAKING Switches; TALLY, ZEBRA

Specifications

VTR Section

VTR Video System (during playback on a standard playback unit)

Bands:	Brightness; 25 Hz to 5.75 MHz+1.0 dB/−3.0 dB
S/N ratio:	55 dB
K factor (2T pulse):	Within 2%
Y/C delay:	Within 20 ns

VTR Audio System (during playback on a standard playback unit)

Sampling frequency:	48 kHz (synchronized to video)
Quantization:	16-bits/sample
Frequency response:	20 Hz to 20 kHz±1.0 dB (at reference level)
Dynamic range:	85 dB or more (at 1 kHz, AWTD)
Distortion:	Within 0.1% (at 1 kHz, operating level)
Wow/flutter:	Below measurable limit
Head room:	18 dB
Emphasis:	T1=50 µs, T2=15 µs (can be turned ON/OFF)

VTR Tape Running System

Tape speed:	33.854 mm/s
Recording/playback time:	Approx. 66 min. (using the AJ-P66MP)
FF/REW time:	Approx. 3 min. (using the AJ-P66MP)

Connectors

Input

AUDIO IN CH1/CH2 (XLRX2, 3-pin, female):	MIC/LINE switchable, balanced, more than 10 kohm MIC; Menu setting to −60/−50/−40 dBu LINE; Menu setting to −6/0/+4 dBu
MIC IN (XLR, 3-pin, female):	Phantom +48 V, −60 dBu, balanced, 3 kohm (Menu setting to −60/−50/−40 dBu)
GENLOCK IN (BNC):	1.0 Vp-p, 75 ohm
TIME CODE IN (12-pin):	0.5 to 18 Vp-p, 10 kohm

Output

CAMERA OUT (BNC):	1.0 Vp-p, 75 ohm
VIDEO OUT (BNC):	1.0 Vp-p, 75 ohm
AUDIO OUT (XLR, 3-pin, male):	0 dBu, balanced, low-impedance (Menu setting to CH1/CH2/MIX)
AUDIO CH1/CH2 OUT (12-pin, TC IN/OUT combined):	−20 dBu, unbalanced, low-impedance
TIME CODE OUT (12-pin):	1.5 Vp-p, 75 ohm
PHONES (mini-jack×1):	

Other

DC IN (XLR, 4-pin, male):	DC 11 to 17 V
DC OUT (4-pin):	DC 11 to 17 V, maximum rated current; 0.1 A
LENS (12-pin):	
SPARE (ECU, 6-pin):	

Accessories

Shoulder Belt (1)
Sony battery connector (screw included)
VIDEO IN connector (1)
AUDIO LEVEL CH1 control knob (screw included) (1)

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Specifications

Related Components

Power supply related

AU-BP220, AU-BP402 battery packs
AG-B425 battery charger (for charging the AU-BP220 and AU-BP402 battery packs)
AU-M402H battery case
AJ-B75 AC adapter

Viewfinder

AJ-VF10E, AJ-VF15E 1.5-inch viewfinders
AJ-VF53E 5-inch viewfinder

External VTR-related

Portable video cassette recorder
AJ-YA710P time code input/output/video input adapter
AJ-YA700P 26-pin output adapter (for connecting an external VTR to the 26-pin interface)
AJ-EC2/AQ-EC1 extension control unit
Connection cables
- AQ-C2605 26-pin (VTR) cable
- SHAN-C12TCA multi connector cable

Audio components

AJ-MC700P microphone kit
AJ-MH700P microphone holder

Maintenance products

AJ-CL12MP cleaning tape
AJ-SC900 soft carrying case
SHAN-B700 carrying case
SHAN-RC700 rain cover

***AQ-EC1 is not available in European market.**
For further details, consult with your dealer.

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5-16. Auto Dark Shading Adjustment 25
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5-21. Modulation Confirmation 28

1. Head Optical Ass'y 1

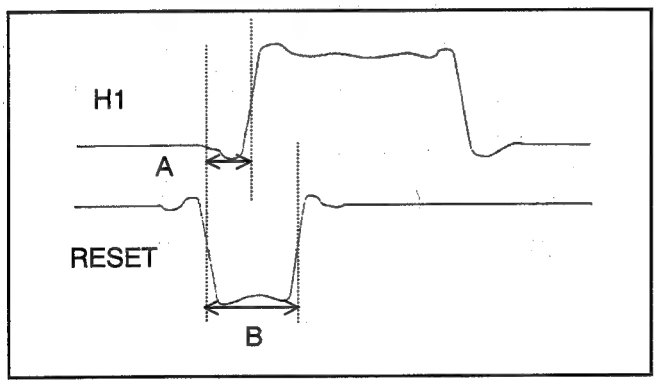
<Note>

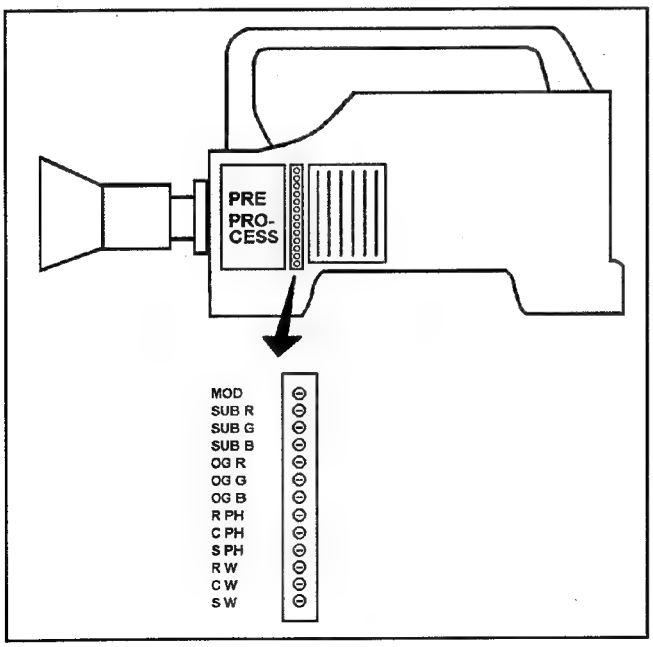
VR10(OG R), VR11(OG G), VR12(OG B) on the PULSE P.C.Board should be set to the center position.

1-1. Reset Pulse Adjustment

BOARD	Pulse
SPEC.	A:5.6±1ns, B:9.6±1ns
TEST	TP1(R),TP3(H1)
ADJUST	VR1(R PH),VR4(R W)
M.EQ	Oscilloscope

1. Remove the Head Optical Ass'y (camera unit).
2. Adjust the **VR4** so that the pulse width B at the **TP1** is within specification.
3. Adjust the **VR1** so that the phase difference A is within specification.(Trigger : TP3)





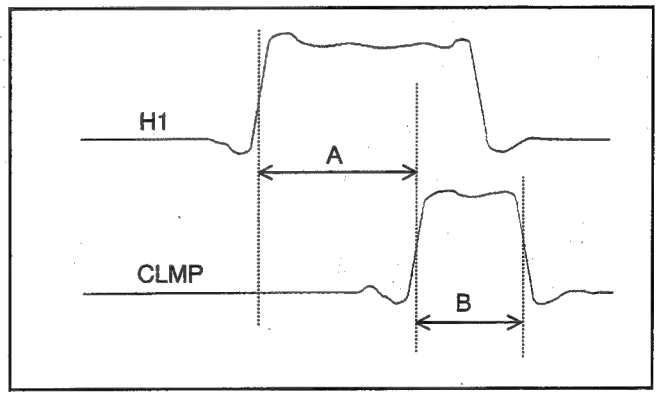
1-2. Clamp Pulse Adjustment

BOARD	Pulse
SPEC.	A:25.4+0.5/-1ns, B:12.5±1ns
TEST	TP3002 (CLMP)(CDS Board),TP3(H1)
ADJUST	VR2(C PH),VR5(C W)
M.EQ	Oscilloscope

1. Adjust the **VR5** so that the pulse width B(TP3002) is within specification.
2. Adjust the **VR2** so that the phase difference A is within specification.(Trigger : TP3)

Note.

1. If the adjustment is not completed even after the VR is fully turned, keep the VR where it is.(left end or right end)



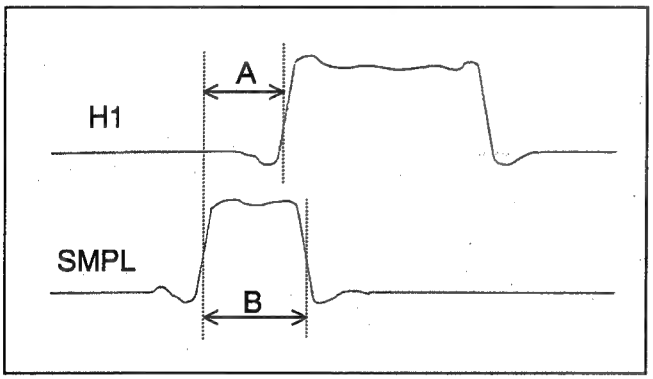
1-3. Sample Pulse Adjustment

BOARD	Pulse
SPEC.	A:17.5±1ns, B:17.9±1ns
TEST	TP3001(SMPL)(CDS Board), TP3(H1)
ADJUST	VR3(S PH), VR6(S W)
M.EQ	Oscilloscope

1. Adjust the **VR6** so that the pulse width B (TP3001) is within specification.
2. Adjust the **VR3** so that the phase difference A is within specification.(Trigger : TP3)

Note.

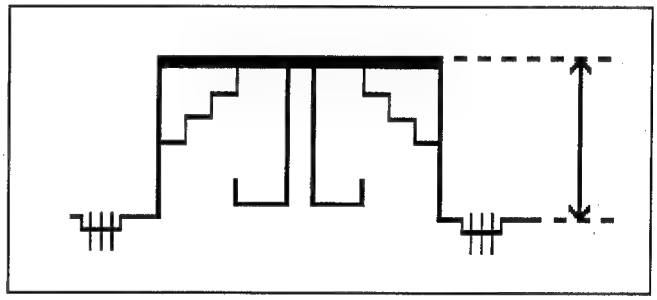
1. If the adjustment is not completed even after the VR is fully turned, keep the VR where it is.(left end or right end)



1-4. Reset DC Adjustment

BOARD	Pulse
TEST	TP3203(CDS Board)
ADJUST	VR13(R DC), VR8 (SUB G)
F.NBR.	Open
CHART	Grayscale Chart
M.EQ	Oscilloscope

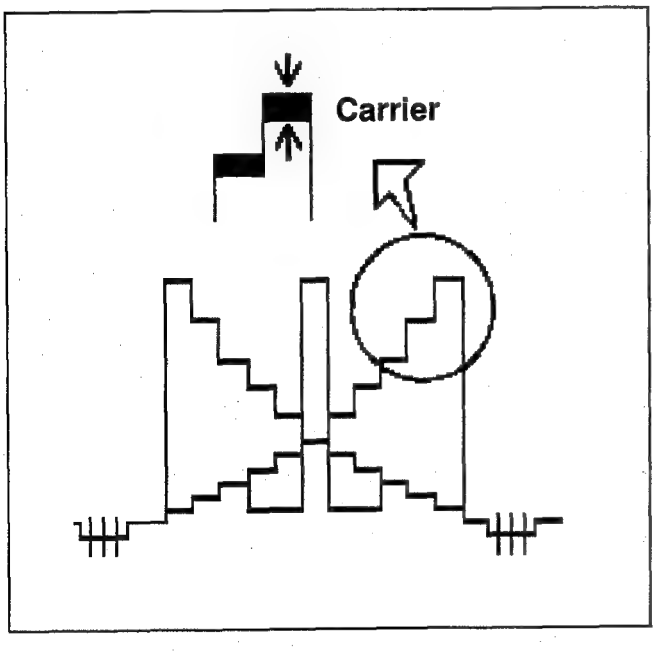
1. Turn the **VR8** counterclockwise fully so that the saturation level depends on R DC.
2. Turn the **VR8** clockwise until the saturation level depends on SUB.
3. Adjust the **VR13** so that the waveform level is maximized.
4. Install the Head Optical Ass'y (camera unit) again.



1-5. Carrier Leak Adjustment

BOARD	CDS
TEST	TP103(R), TP203(G), TP303(B)
ADJUST	VC101(R), VC201(G), VC301(B)
F.NBR.	F8 (2000LUX)
CHART	Grayscale Chart
M.EQ	Oscilloscope, Lux Meter

1. Monitor the **TP103** and adjust the **VC101** so that the carrier leak is minimized.
2. Monitor the **TP203** and adjust the **VC201** so that the carrier leak is minimized.
3. Monitor the **TP303** and adjust the **VC301** so that the carrier leak is minimized.



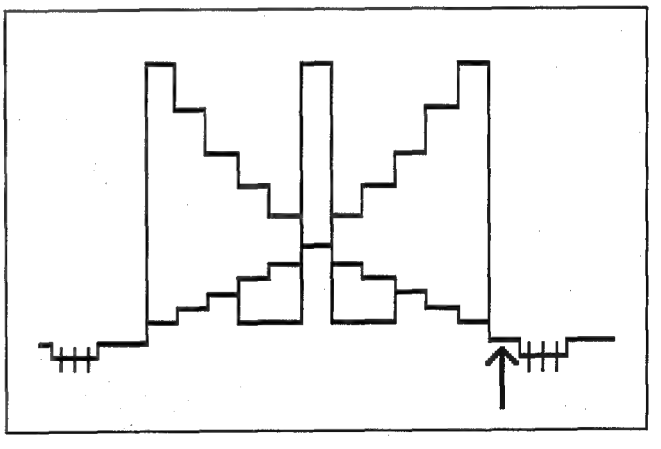
1-6. CDS OUT DC Adjustment

BOARD	CDS
SPEC.	150±50mV
TEST	TP103(R), TP203(G), TP303(B)
ADJUST	VR102(R), VR202(G), VR302(B)
F.NBR.	F8
CHART	Grayscale Chart
M.EQ	Oscilloscope

1. Monitor the **TP103** and adjust the **VR102** so that the black level is within specification.
2. Monitor the **TP203** and adjust the **VR202** so that the black level is within specification.
3. Monitor the **TP303** and adjust the **VR302** so that the black level is within specification.

Note.

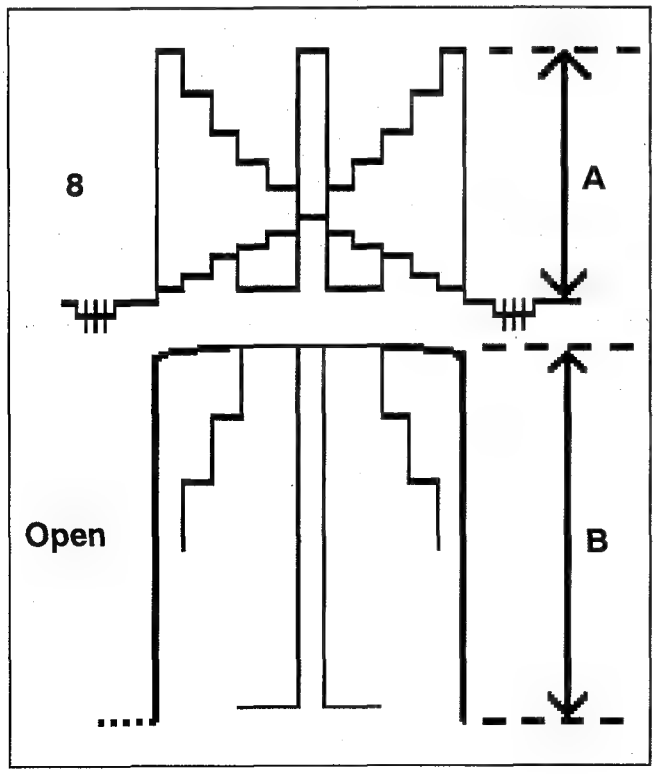
1. In case that it is difficult to recognize the black level, close the iris.
2. Monitor the center of the carrier because there is carrier on the black level.



1-7. SUB Voltage Adjustment 1

BOARD	Pulse
SPEC.	B/A = 4±0. 2
TEST	TP103, TP203, TP303(CDS), TP4
ADJUST	VR7(R), VR8(G), VR9(B), VR13(R DC)
F.NBR.	F8 (2000LUX),Open
CHART	Grayscale Chart
M.EQ	Oscilloscope

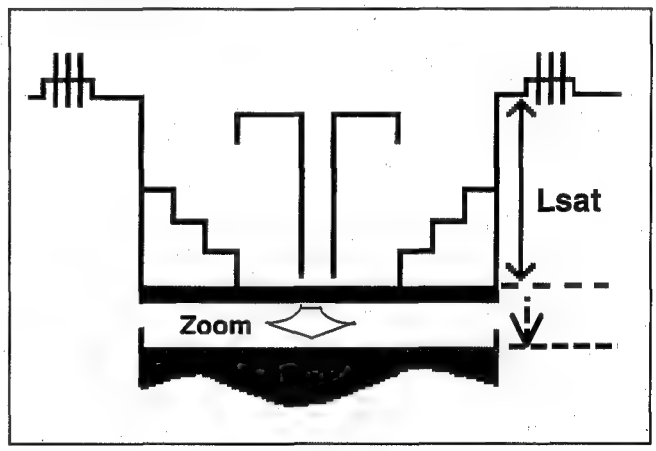
1. Monitor the **TP203** (G) on the CDS Board and measure the level A in IRIS F8.
2. Measure the level B in IRIS open.
3. Adjust the **VR8** (SUB-G) so that the B/A ratio is within specification.
4. Adjust the **VR13** so that the level B is maximized.(Exceeding specification is no problem if the voltage at **TP4** is more than 1.7V.)
5. Repeat 1 to 4 to adjust G ch.
6. Monitor the **TP103** (R) and adjust the **VR7** in the same way. (Do not adjust VR13.)
7. Monitor the **TP303** (B) and adjust the **VR9** in the same way. (Do not adjust VR13.)
8. After the adjustment confirm the CDS OUT DC adjustment again.



1-8. SUB Voltage Adjustment 2

BOARD	Pulse
SPEC.	2600±50mV
TEST	TP2, TP202, TP402(Pre Process)
ADJUST	VR7(R), VR8(G), VR9(B)
F.NBR.	Open(2000LUX)
CHART	Grayscale Chart
M.EQ	Oscilloscope

1. Monitor the **TP2** on the Pre Process Board and adjust the **VR7** so that the voltage Lsat is within specification.
2. Monitor the **TP202** on the Pre Process Board and adjust the **VR8** so that the voltage Lsat is within specification.
3. Monitor the **TP402** on the Pre Process Board and adjust the **VR9** so that the voltage Lsat is within specification.



1-9. SUB Voltage Confirmation

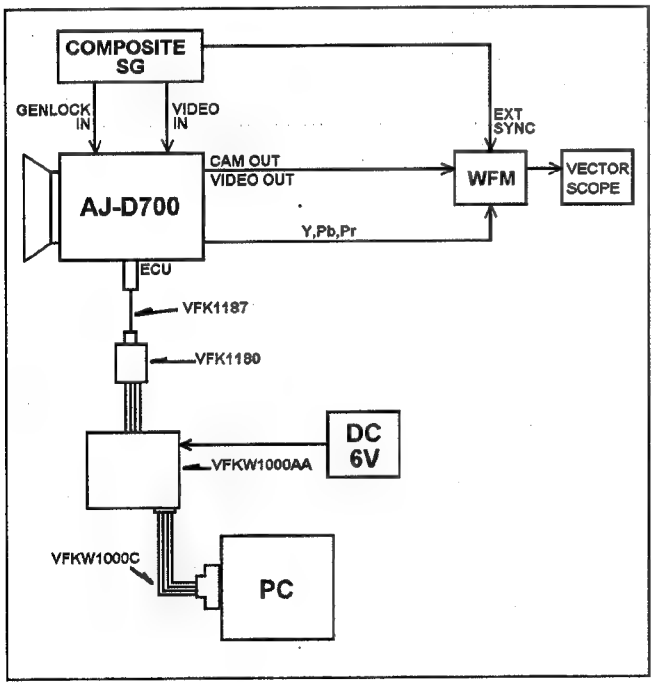
BOARD	Pulse
TEST	VIDEO OUT(75Ωterminated)
ADJUST	VR7(R), VR8(G), VR9(B)
M.EQ	Color Monitor TV, 500W Halogen Lamp

1. Shoot the halogen lamp so that it is one tenth as large as the size of monitor.
2. Confirm that the blooming part has no color.
3. If that part has some color, do SUB Voltage Adjustment1 and 2.

2. Video Main and DSP

2-1. Initial Setting

1. Set the Camera Recorder as follows:
   AUTO W/B BAL:OFF
   SHUTTER :OFF
   GAIN :L
   OUTPUT :BAR
   WHITE BAL :PRE
2. Turn the power switches of the camera recorder and the EVR OFF.
3. Connect the EVR with ECU connector as shown in figure.
4. Turn the power of EVR ON and then camera recorder ON.
5. Pressing [SHIFT],[+] and [-] buttons in operation panel, set the MENU SW to SET.
6. Press the PAGE button to open the SERVICE ADJ. menu. Select EVR in ECU CONNECT. After setting turn the MENU OFF.
7. Excute the CAM_TOOL. EXE to start EVR program. (Refer to Setup of EVR Tool.)



2-2. D3.0V Adjustment

BOARD	Video Main
SPEC.	3.15V+0.05V / -0.00V
TEST	TP9
ADJUST	VR5 (Power)
MODE	REC
M.EQ	Digital Volt Meter

1. Adjust the **VR5** on Power board so that the voltage at the **TP9** is within specification.

2-3. Ref DC for A/D Adjustment

BOARD	DSP
SPEC.	2.0±0.001V
TEST	TP6
ADJUST	VR1
M.EQ	Digital Volt Meter

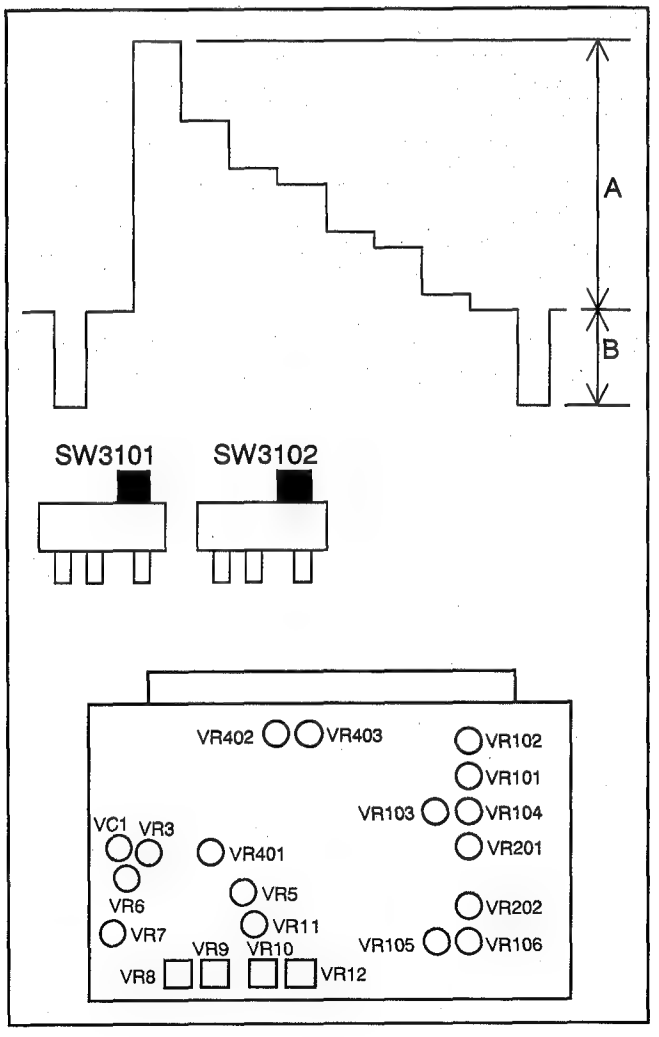
1. Confirm that the DC voltage at **TP6** is within specification, and adjust the **VR1** in case of need.

3. Encoder

3-1. Y & SYNC Levels Adjustment 1

BOARD	Encoder
SPEC.	A:1400±28mV, B:600±12mV
TEST	TP104
ADJUST	VR102, VR101, SW101, SW102
MODE	Camera Bar
M.EQ	Oscilloscope

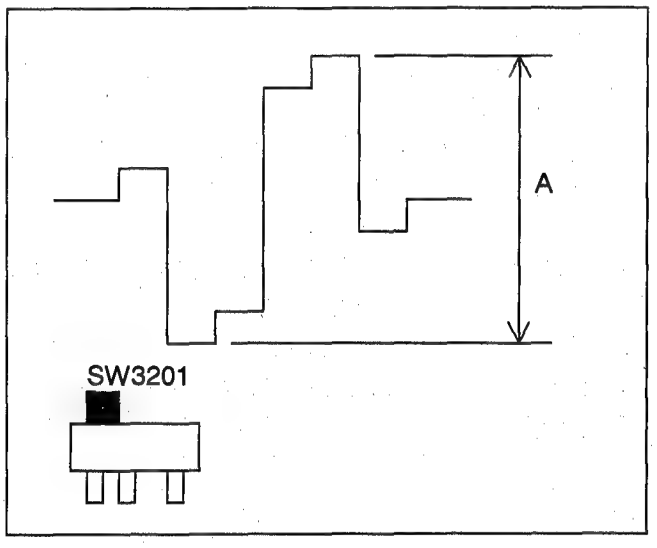
1. Confirm that the **SW101** and **SW102** are turned **ON** as shown in figure.
2. Monitor the **TP104** and adjust the **VR102** so that the level A is within specification.
3. Adjust the **VR101** so that the level B is within specification.



3-2. Pr Level Adjustment

BOARD	Encoder
SPEC.	1050±20mV
TEST	TP203
ADJUST	VR201, SW201
MODE	Camera Bar
M.EQ	Oscilloscope

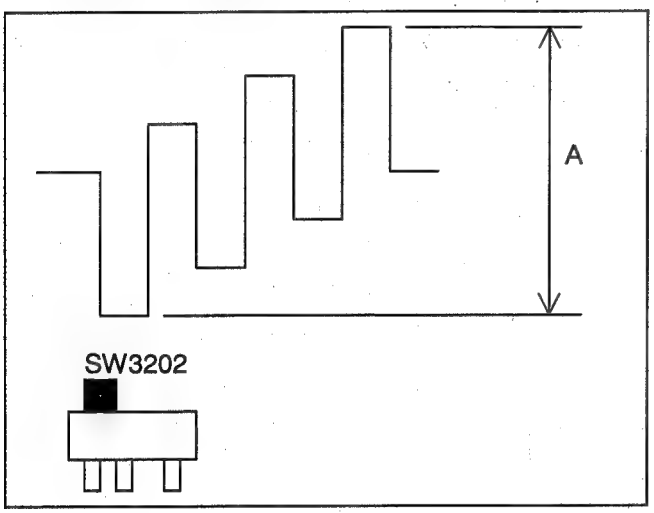
1. Set the **SW201** as shown in figure and adjust the **VR201** so that the level A is within specification.



3-3. Pb Level Adjustment

BOARD	Encoder
SPEC.	1050±20mV
TEST	TP204
ADJUST	VR202, SW202
MODE	Camera Bar
M.EQ	Oscilloscope

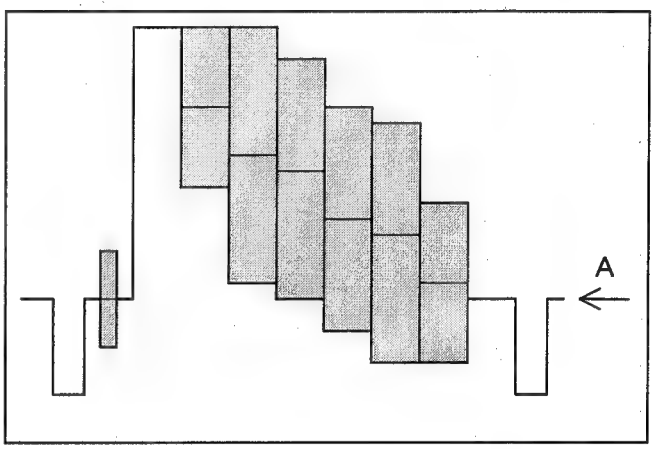
1. Set the **SW202** as shown in figure and adjust the **VR202** so that the level A is within specification.



3-4. CAM DC Adjustment

BOARD	Encoder
SPEC.	0±10mV
TEST	CAM OUT (75Ω terminated)
ADJUST	VR11
MODE	Camera Bar
M.EQ	Waveform Monitor

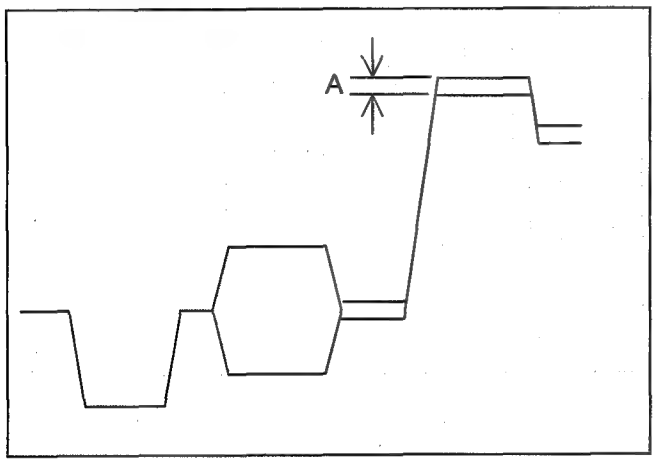
1. Adjust the **VR11** so that the DC voltage is within specification.



3-5. Carrier Balance Adjustment

BOARD	Encoder
SPEC.	A = Minimum
TEST	CAM OUT (75Ω terminated)
ADJUST	VR8, VR9
MODE	Camera Bar
M.EQ	Waveform Monitor

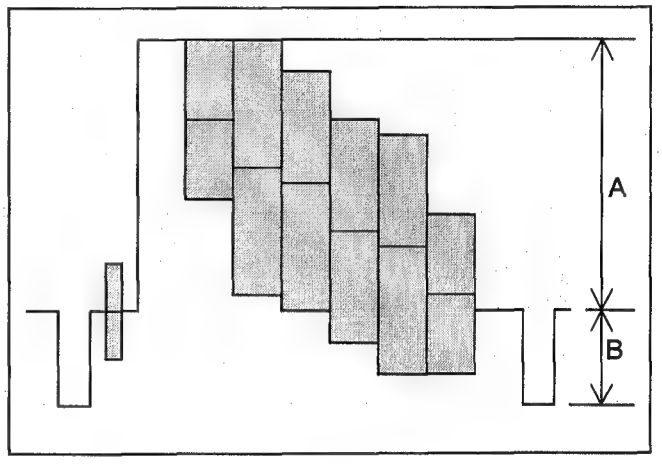
1. Adjust the **VR8** so that the width A is minimized.
2. Adjust the **VR9** as well as **VR8**.
3. Repeat the above steps until the width A is minimized.



3-6. Y & SYNC Levels Adjustment 2

BOARD	Encoder
SPEC.	A:700±14mV, B:300±6mV
TEST	CAM OUT (75Ω terminated)
ADJUST	VR12, VR106, VR105
MODE	Camera Bar
M.EQ	Waveform Monitor

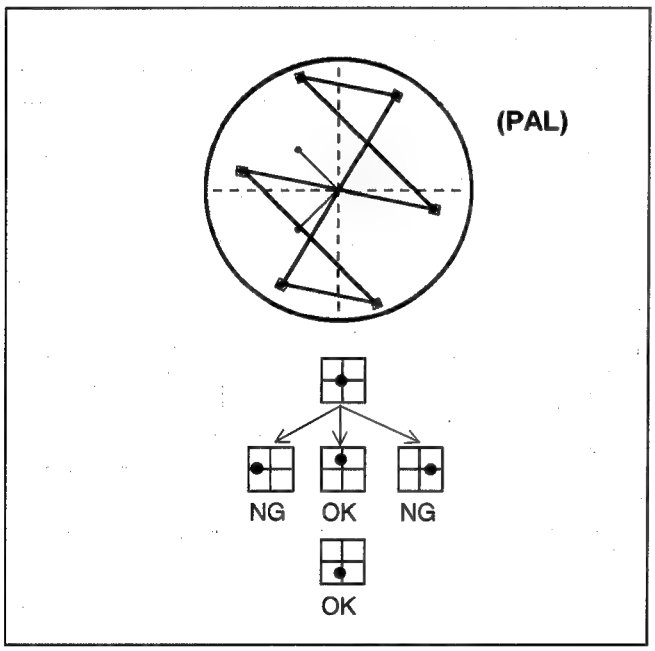
1. Set the **VR12** to **CENTER** position.
2. Adjust the **VR106** so that the level A is within specification.
3. Adjust the **VR105** so that the level B is within specification.



3-7. Burst Level & Vector Adjustment

BOARD	Encoder
TEST	CAM OUT (75Ω terminated)
ADJUST	VR6, VR7, VC1, VR3, VR5, VR10
MODE	Camera Bar
M.EQ	Vector Scope

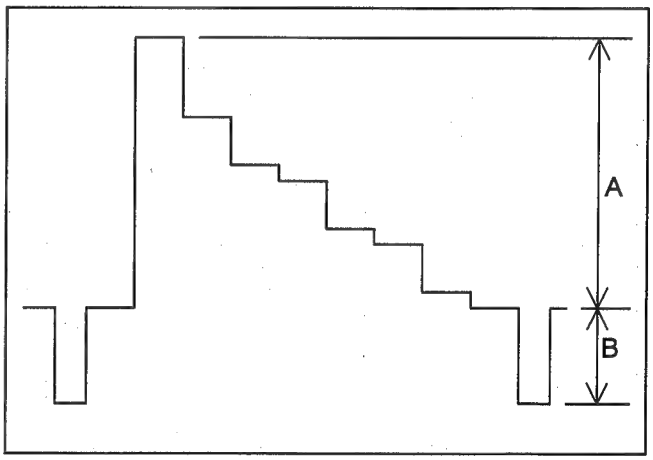
1. Set the **VR10** to the centre position.
2. Adjust the **VC1** so that both burst levels are the same.
3. Adjust the **VR6** and **VR7** so that both bursts are fixed on scales.
4. Adjust the **VR3, VR5 and VC1** so that all colour phase are fixed on scales



3-8. Video Out & Sync Adjustment

BOARD	Encoder
SPEC.	A:700±14mV, B:300±6mV
TEST	VIDEO OUT (75Ω terminated)
ADJUST	VR104, VR103
MODE	Camera Bar
M.EQ	Waveform Monitor, EVR

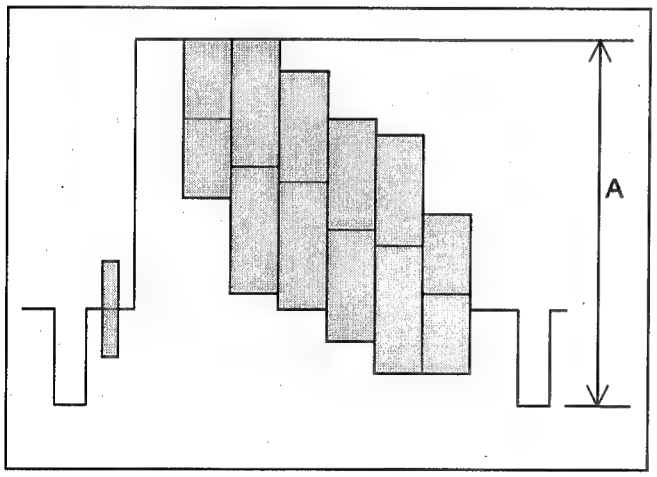
1. Press the [F2] and [0] in EVR and confirm that the EVR display indicates [1E][02][00].(Video out : Y out)
2. Connect the Waveform Monitor with VIDEO OUT and adjust the **VR104** so that the level A is within specification.
3. Adjust the **VR103** so that the level B is within specification.



3-9. Return Video Level Adjustment

BOARD	Encoder
SPEC.	A=1V±20mV
TEST	VIDEO OUT
ADJUST	VR403
MODE	Video In : Colour Bar
M.EQ	Waveform Monitor, EVR, Signal GEN

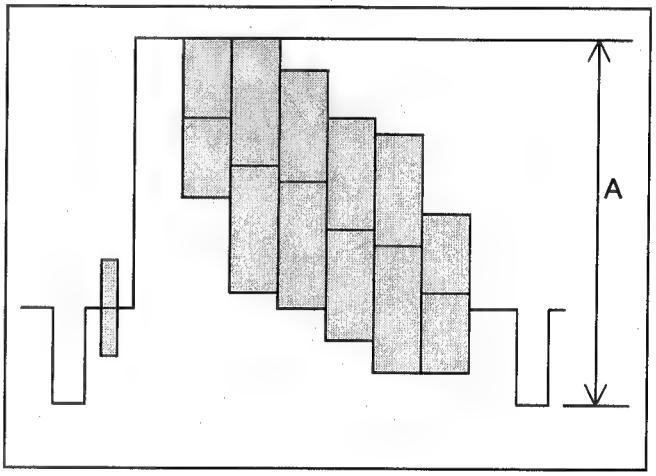
1. Mounting the VIDEO IN connector (Accessory). See operating instruction page 17.
2. Input the colour bar signal to VIDEO IN connector.
3. Input the following [CMD][DATA][ADR] and return.
   [CMD] [1E]
   [DATA] [04]
   [ADR] [00]
4. Connect the Waveform Monitor with VIDEO OUT and adjust the **VR403** so that the level A is within specification.



3-10. Mon Enc Level Adjustment

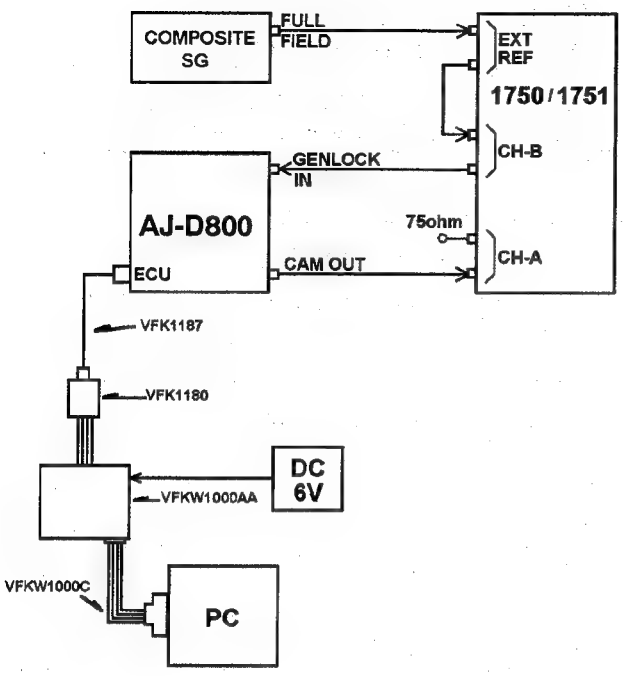
BOARD	Encoder
SPEC.	A:1V±20mV
TEST	VIDEO OUT
ADJUST	VR401
MODE	Camera Bar
M.EQ	Waveform Monitor, EVR

1. Confirm that the EVR display indicates [1E][03][00] and then press the [→] to set the EVR to [1E][04][00]. Otherwise press the [CMD][1E] [DATA][04] [ADR][00] [SET] to input [1E][04][00].
2. Connect the Waveform Monitor with VIDEO OUT and adjust the **VR401** so that the level A is within specification.
3. Set the **SW101** and **SW102** to **OFF**.



4. Sync (For VEP23446B)

4-1. Connection



4-2. 4fsc VCO Adjustment

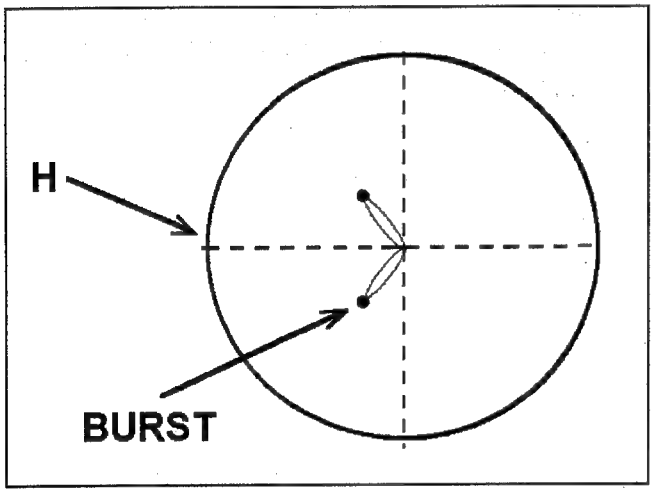
BOARD	Sync
SPEC.	17.734475MHz±10Hz
TEST	IC3018 10pin, TP11
ADJUST	VR12
MODE	Camera Bar
M.EQ	Oscilloscope, Frequency Counter

1. Disconnect GEN LOCK IN and adjust the **VR12** so that the frequency at **IC3018 10pin** is within specification.
2. Input the composite signal to GEN LOCK IN and confirm that the DC voltage at **TP11** is 2.5±0.5V and stable.

4-3. SCH Phase Adjustment

BOARD	Sync
SPEC.	0±2°
TEST	CAM OUT
ADJUST	VR5
MODE	Camera Bar
M.EQ	SCH Meter

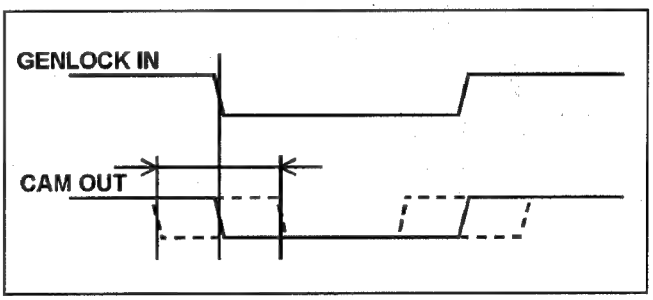
1. Disconnect GEN LOCK IN and set the SCH Meter to INT mode.
2. Adjust the **VR5** so that the SCH is within specification.



4-4. System Phase Adjustment 1

BOARD	Sync
TEST	CAM OUT
ADJUST	VR6
INPUT	Composite(RS-170A)
MODE	Camera Bar
M.EQ	Waveform Monitor, EVR

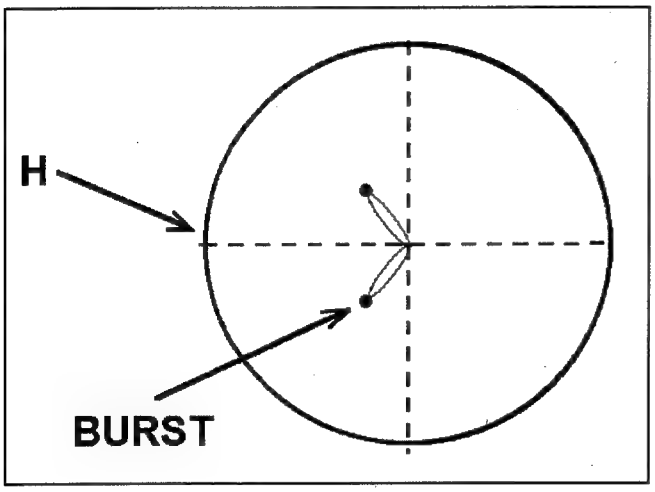
1. Set the Waveform Monitor to EXT mode.
2. Set the EVR to [1E][14][00].
3. Confirm that the composite signal is input to GEN LOCK IN.
4. Adjust the **VR6** so that CAM OUT and GEN LOCK IN are the same in sync phase.



4-5. System Phase Adjustment 2

BOARD	Sync
TEST	CAM OUT
ADJUST	VR6, VR7
INPUT	Composite(RS-170A)
MODE	Camera Bar
M.EQ	SCH Meter, EVR

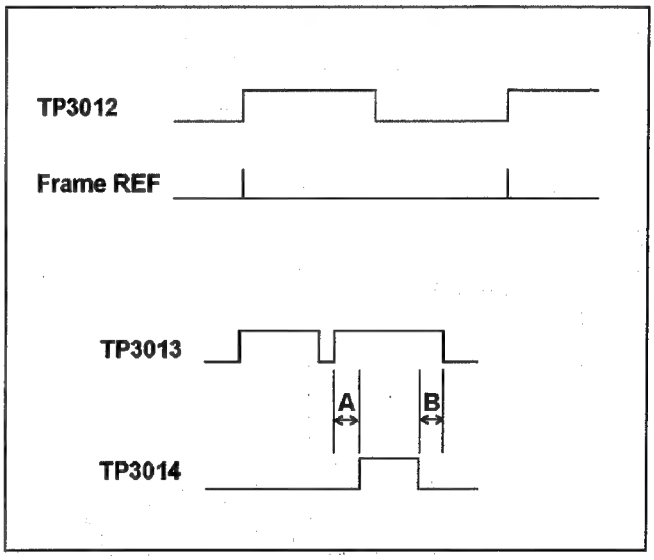
1. Set the SCH Meter to EXT mode.
2. Adjust the **VR6** slightly so that CAM OUT and GEN LOCK IN are the same in H phase.
3. Set the EVR to [1E][1C][00].
4. Adjust the **VR7** so that CAM OUT and GEN LOCK IN are the same in burst phase.



4-6. REF SCH Adjustment

BOARD	Sync
SPEC.	A = B±10%
TEST	TP3012, 3013, 3014
ADJUST	VR3002
M.EQ	Oscilloscope

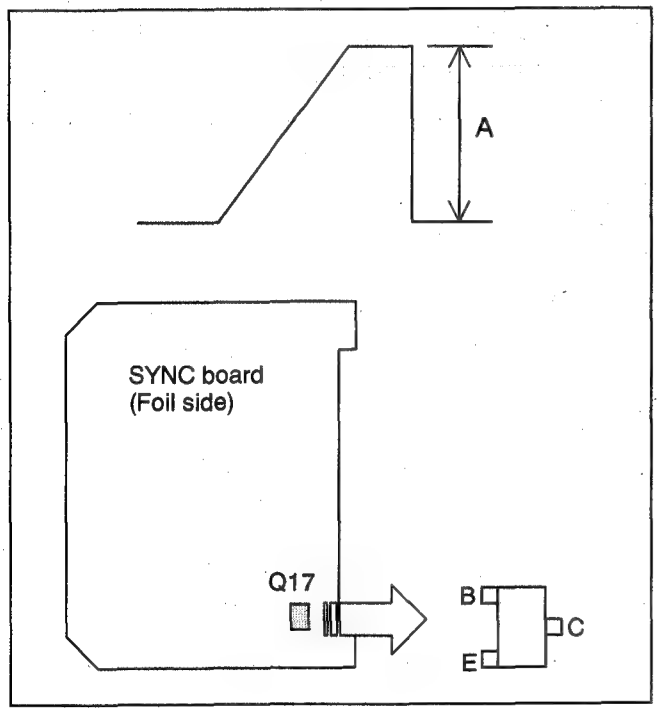
1. If it is impossible to make "4-3. SCH Phase Adjustment", try this item.
2. Adjust the **VR3002** so that the relation between frame pulse from signal generator and **TP3012** is as shown in the figure. (Course adjustment)
3. Adjust the **VR3002** so that the relation between **TP3013** and **TP3014** is within specification.



4-7. Test Signal Level Adjustment

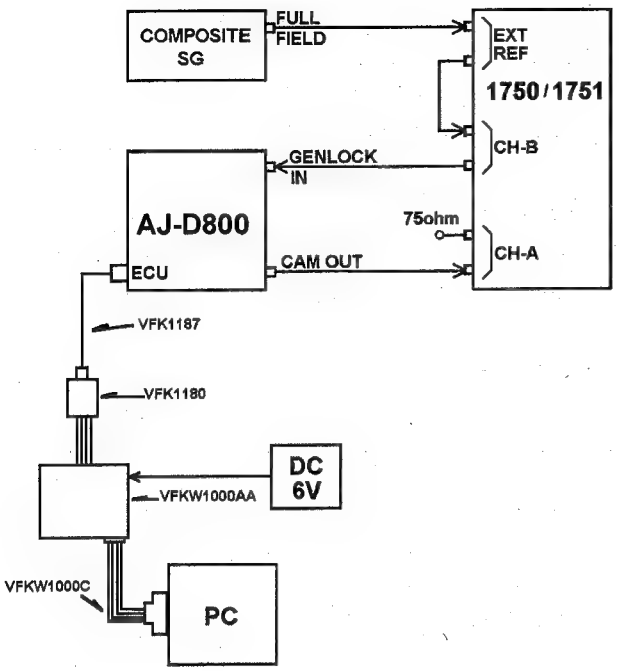
BOARD	SYNC
SPEC.	A=1.9V±0.1V
TEST	Q3017 Emitter
ADJUST	VR3011
MODE	Test Signal
M.EQ	Oscilloscope, EVR

1. Set the EVR to [1E][22][00].
2. Monitor the **Q3017 Emitter** and adjust the **VR3011** so that the level A is within specification.



4. Sync (For VEP23446B-1)

4-1. Connection



4-2. 4fsc VCO Adjustment

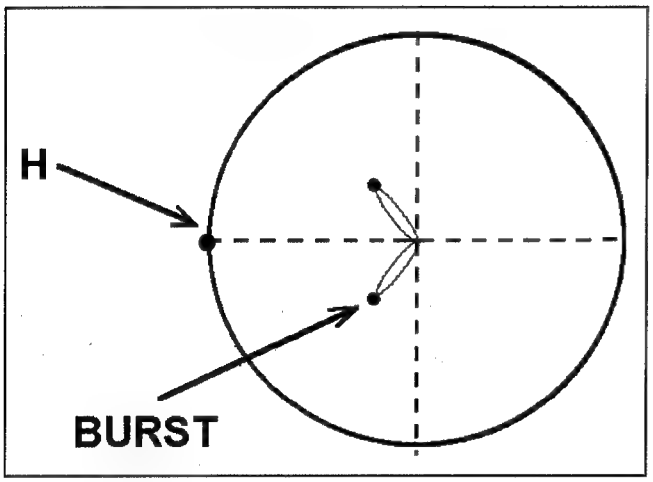
BOARD	Sync
SPEC.	17.734475MHz±10Hz
TEST	TP3101
ADJUST	VR3104
MODE	Camera Bar
M.EQ	Oscilloscope, Frequency Counter

1. Disconnect GEN LOCK IN and adjust the **VR3104** so that the frequency at **TP3101** is within specification.

4-3. SCH Phase Adjustment

BOARD	Sync
SPEC.	0±2°
TEST	CAM OUT (75Ω terminated)
ADJUST	VR3102
MODE	Camera Bar
M.EQ	SCH Meter

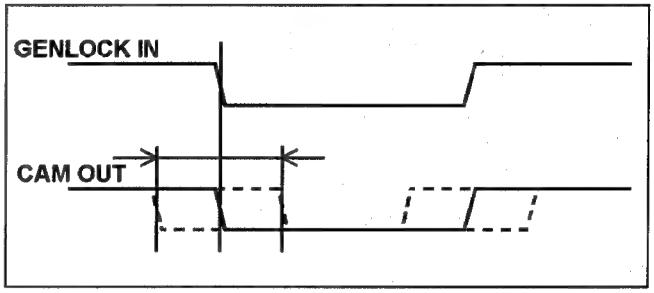
1. Disconnect GEN LOCK IN and set the SCH Meter to INT mode.
2. Adjust the **VR3102** so that the SCH is within specification.



4-4. System Phase Adjustment 1

BOARD	Sync
TEST	CAM OUT (75Ω terminated)
ADJUST	VR3103
INPUT	Composite(RS-170A)
MODE	Camera Bar
M.EQ	Waveform Monitor, EVR

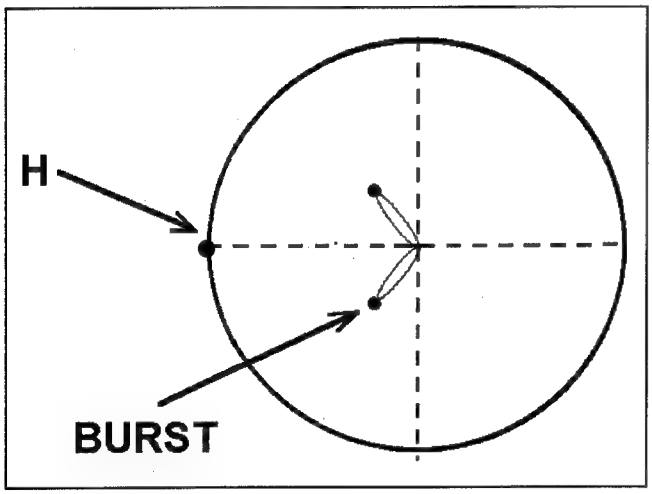
1. Set the Waveform Monitor to EXT mode.
2. Set the EVR to [1E][14][00].(H PHASE : Centre)
3. Confirm that the composite signal is input to GEN LOCK IN.
4. Adjust the **VR3103** so that CAM OUT and GEN LOCK IN are the same in sync phase.



4-5. System Phase Adjustment 2

BOARD	Sync
TEST	CAM OUT
ADJUST	VR3103, VR3001
INPUT	Composite(RS-170A)
MODE	Camera Bar
M.EQ	SCH Meter, EVR

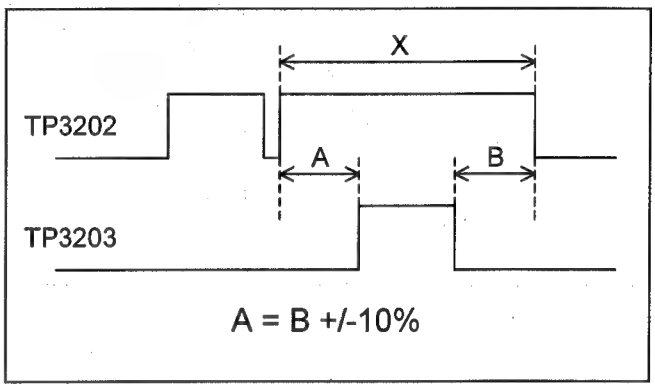
1. Set the SCH Meter to EXT mode.
2. Adjust the **VR3103** slightly so that CAM OUT and GEN LOCK IN are the same in H phase.
3. Set the EVR to [1E][1C][00].(SC PHASE FINE : Centre)
4. Adjust the **VR3001** so that CAM OUT and GEN LOCK IN are the same in burst phase.



4-6. Ref. SCH Adjustment

BOARD	Sync
SPEC	A = B +/-10%
TEST	TP3202, TP3203
ADJUST	VR3101
INPUT	Composite(RS-170A)
MODE	Camera Bar
M.EQ	Oscilloscope

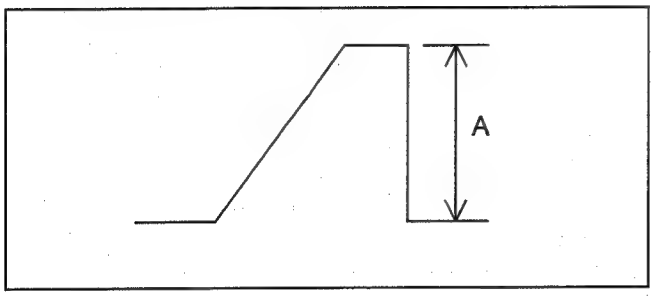
1. Adjust the **VR3101** so that the High portion of **TP3203** is centred at X portion of **TP3203**.



4-7. Test Signal Level Adjustment

BOARD	SYNC
SPEC.	A=1.9V±0.1V
TEST	TP3501
ADJUST	VR3504
MODE	Test Signal
M.EQ	Oscilloscope, EVR

1. Set the EVR to [1E][22][00].
2. Monitor the **TP3501** and adjust the **VR3504** so that the level A is within specification.



5. Head Optical Ass'y 2

5-1. AWB Preset Level Adjustment

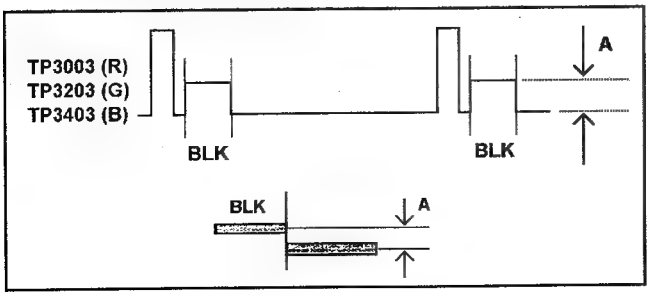
BOARD	CAM SYSCON
SPEC.	2.0V±0.01V
TEST	TP3514 (AWB R), TP3515 (AWB B) TG3500 (GND)
ADJUST	EVR
MODE	------
M.EQ	D.V.M, EVR

1. Set the AWB SW to "PRESET" mode.
2. Connect the DVM to TP3514 (AWB R) and TG3500 (GND)
3. Set the EVR to [0E][66][61]. And press the [→] or [←] key in EVR so that the DC voltage is within specification.
4. Connect the DVM to TP3515 (AWB B) and TG3500 (GND)
5. Set the EVR to [0E][66][62]. And press the [→] or [←] key in EVR so that the DC voltage is within specification.
6. Turn the power switch to off.

5-2. RGB Pedestal Adjustment

BOARD	Pre Process
SPEC.	0±50mV
TEST	TP3, TP203, TP403
ADJUST	VR1, VR201, VR401
F.NBR.	Close
M.EQ	Oscilloscope, EVR

1. Press the [F2] and [2] keys in EVR or input [1E][20][00]. (Set the "PED R,G,B" signal to ;2.0VDC)
2. Monitor the **TP3** and adjust the **VR1** (R PED) so that the blanking level is flat.
3. Monitor the **TP203** and adjust the **VR201** (G PED) so that the blanking level is flat.
4. Monitor the **TP403** and adjust the **VR401** (B PED) so that the blanking level is flat.



5-3. 0% ABB Adjustment

BOARD	Pre Process
SPEC.	------
TEST	------
ADJUST	EVR
MODE	------
M.EQ	EVR

<Note>

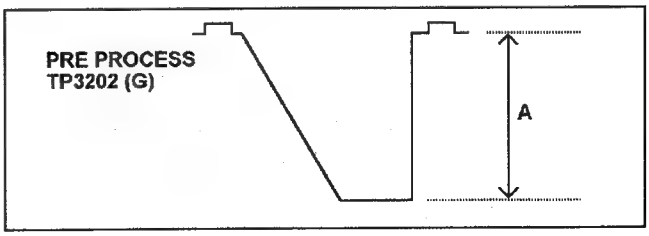
From next 5-3 Test Signal Level Adjustment are necessary this 0% ABB setting. If perform the adjustment individually, this 0% ABB must be done before adjustment.

7. Set the EVR to [1E][21][00].
8. Perform the ABB by front switch.

5-4. Test Signal Level Adjustment

BOARD	Pre Process
SPEC.	666±10mV
TEST	TP2(R), TP202(G), TP402(B)
ADJUST	VR3505(R), VR3506(G), VR3507(B) (on the Sync board)
MODE	Test Signal
M.EQ	Oscilloscope, EVR

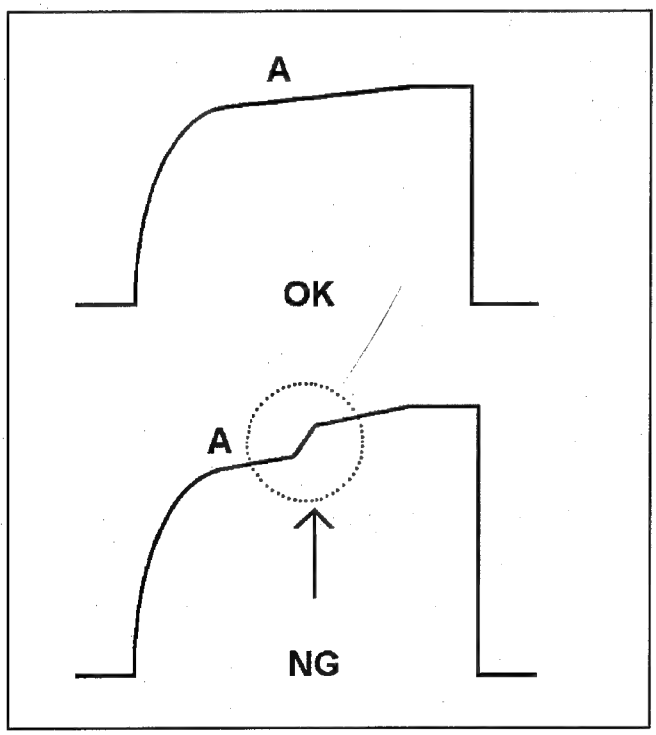
1. Set the EVR to [1E][22][00].
2. Monitor the **TP2** and adjust the **VR3505** so that the level A is within specification.
3. Monitor the **TP202** and adjust the **VR3506** so that the level A is within specification.
4. Monitor the **TP402** and adjust the **VR3507** so that the level A is within specification.



5-5. A/D Input Level Adjustment 1

BOARD	Pre Process
TEST	VIDEO OUT(75Ωterminated)
ADJUST	VR2(R), VR202(G), VR402(B)
MODE	Test Signal
M.EQ	Waveform Monitor, EVR

1. Set the EVR to [1E][23][00].(R ch is selected.)
2. Adjust the **VR2** to increase the A/D level and then stop adjusting just before the A portion is uneven.
3. Set the EVR to [1E][24][00].(G ch is selected.)
4. Adjust the **VR202** to increase the A/D level and then stop adjusting just before the A portion is uneven.
5. Set the EVR to [1E][25][00].(B ch is selected.)
6. Adjust the **VR402** to increase the A/D level and then stop adjusting just before the A portion is uneven.



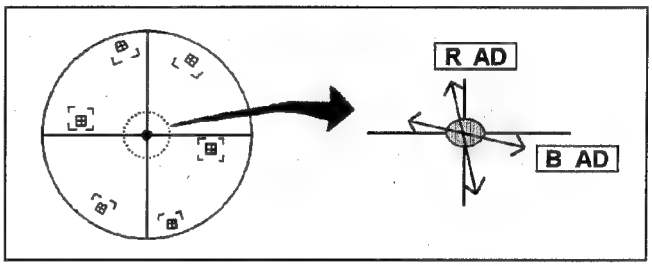
5-6. A/D Input Level Adjustment 2

BOARD	Pre Process
TEST	CAM OUT(75Ωterminated)
ADJUST	VR2(R), VR402(B)
MODE	Test Signal
M.EQ	Vector Scope

<Note>

Not use the EVR tool.

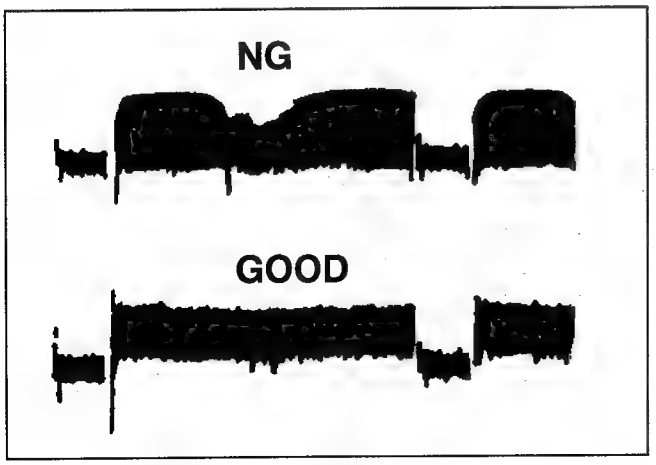
1. Set the Test saw on the Service ADJ menu to on.
2. Set the GAIN to +9dB and Auto Knee to OFF.
3. Set the Vector Scope Gain to MAX.
4. Fineadjust the **VR2** and **VR402** so that the dot is at the center of the vector scope.



5-7. Shading Balance Adjustment

BOARD	Pre Process
SPEC.	Flat
TEST	TP3 [R], TP203 [G], TP403 [B]
ADJUST	VR4 [R BAL] , VR204 [G BAL], VR304 [B BAL]
F.NBR.	F8+1/3(2000LUX), Optical Filter:1
CHART	Grayscale Chart(3200 ° K)
M.EQ	Oscilloscope, Lux Meter, Color Pyrometer

1. Shoot the Grayscale chart.
2. Perform the Digital White shading.
   1) Set the EVR to [1E][30][00]. (GAIN = 0dB, Knee = OFF)
   2) Set the EVR to [1E][31][00] (Start the Digital White Shading collection) (While executing, '*' or 'ACTIVE' is displayed on EVF.)
3. Close the IRIS.
4. Monitor the **TP3** and adjust **VR4** so that the carrier is minimized as shown in figure.
5. Monitor the **TP203** and adjust **VR204** so that the carrier is minimized as shown in figure.
6. Monitor the **TP403** and adjust **VR304** so that the carrier is minimized as shown in figure.
7. Perform the Digital White Shading again with no shading white chart. (See 5-13 Digital White Shading)



5-8. Pedestal Tracking Adjustment

BOARD	Pre Process
TEST	CAM OUT(75Ω terminated)
ADJUST	VR3(R), VR403(B)
F.NBR.	Close
M.EQ	Vector Scope, EVR

1. Pressing [SHIFT],[+] and [-] buttons in operation panel, set the MENU SW to SET.
2. Press the PAGE button to open the following menus and memorize the number. And then set to **zero**.
   LEVEL 4/6 : R, G, B FLARE
   : R, B GAMMA
   SERVICE ADJ. : R, B GAMMA
3. Set the EVR to [1E][28][00].(Master PED = MAX)
4. Set the Vector Scope to Gain : MAX.
5. Adjust the **VR3** and **VR403** so that the dot is at the center of the vector scope.
6. Press [→] key to set to [1E][29][00].(Master PED = minimum) Confirm that the dot is still at the center of the vector scope.
7. If not, repeat 3,5 and 6.
8. After adjustment, the data of following menus set to original number.
   LEVEL 4/6 : R, G, B FLARE
   : R, B GAMMA
   SERVICE ADJ. : R, B GAMMA

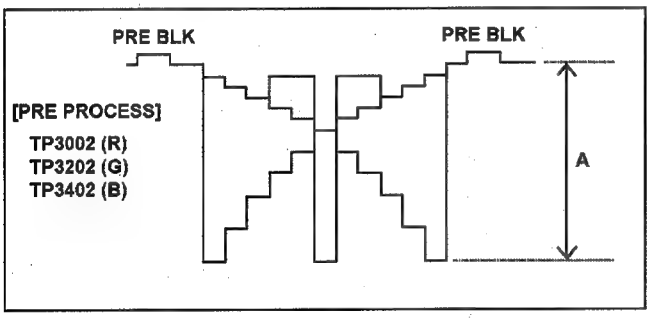
Note.

1. Adjust the VR3 to move vertically and the VR403 horizontally.

5-9. Sample & Hold Level Adjustment 1

BOARD	Pre Process
SPEC.	666±10mV
TEST	TP2, TP202, TP402
ADJUST	VR101, VR201, VR301(CDS Board)
F.NBR.	F8+1/3(2000LUX), Optical Filter:1
CHART	Grayscale Chart(3200° K)
M.EQ	Oscilloscope, Lux Meter, Color Pyrometer

8. Set as follows :
   CAM/BAR : CAM(AGAM:ON)
   AWB : PRESET
   GAIN : 0dB
2. Don't use an extender of lens.
3. Set the EVR to [1E][27][00].
   (GAIN = 0dB, Knee = OFF, TEST SIG = OFF)
4. Monitor the **TP2** and adjust the **VR101**(R LVL) so that the level A is within specification.
5. Monitor the **TP202** and adjust the **VR201**(G LVL) so that the level A is within specification.
6. Monitor the **TP402** and adjust the **VR301**(B LVL) so that the level A is within specification.



5-10. Fixed Pattern Noise Confirmation

BOARD	Pulse
TEST	CAM OUT
ADJUST	VR3(on the Pulse board)
F.NBR.	Close
M.EQ	Monitor TV, EVR

1. Set the EVR to [1E][36][00]
   (GAIN=+18dB, Pedestal=30%).
2. Execute the ABB function.
3. Confirm that there is no fixed pattern noise vertically with lens closed.
4. If there is, set the EVR to [1E][37][00],
   (GAIN = +18dB, Pedestal = 30%, Detail = OFF, 2DLPF = ON, Masking = OFF)
   and then adjust the **VR3**, remember the original position of **VR3**, so that the noise is minimized. (If the noise is not decreased, set **VR3** to the original position again.)

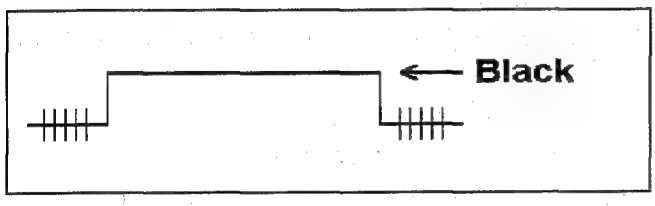
5-11. CDS DC Adjustment

BOARD	CDS
SPEC.	150±50mVdc
TEST	TP103(R), TP203(G), TP303(B)
ADJUST	VR102(R), VR202(G), VR302(B)
F.NBR.	Close
M.EQ	Oscilloscope

1. Monitor the **TP103** and adjust the **VR102** so that the black level is within specification.
2. Monitor the **TP203** and adjust the **VR202** so that the black level is within specification.
3. Monitor the **TP303** and adjust the **VR302** so that the black level is within specification.

Note.

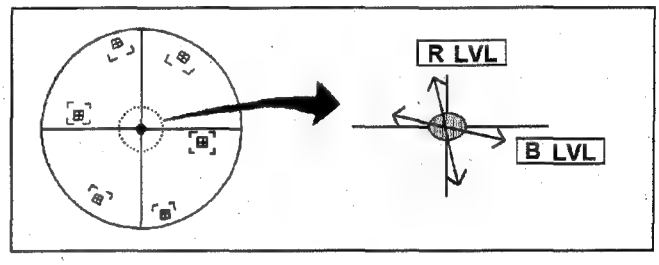
1. Monitor the center of the carrier because there is carrier on the black level.



5-12. Sample & Hold Level Adjustment 2

BOARD	CDS
TEST	CAM OUT
ADJUST	VR101(R LVL), VR301(B LVL)
F.NBR.	F8 (2000LUX), Optical Filter:1
CHART	Grayscale Chart
M.EQ	Vector Scope,Lux Meter, Color Pyrometer

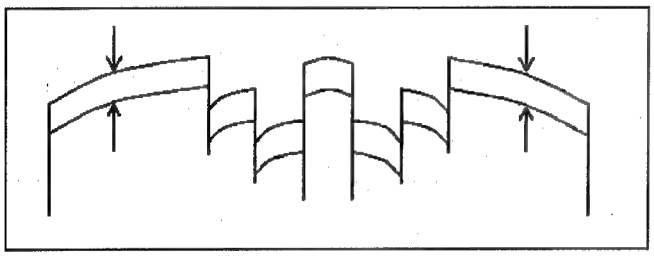
1. Set the EVR to [1E][27][00].
2. Set the Vector Scope to Gain:MAX.
3. Adjust the **VR101** and **VR301** slightly so that the dot is at the center of the vector scope.



5-13. Carrier Level Adjustment

BOARD	Pulse
TEST	CAM OUT
ADJUST	VR7(SUB R), VR9(SUB B)
CHART	Grayscale Chart
M.EQ	Waveform Monitor, EVR

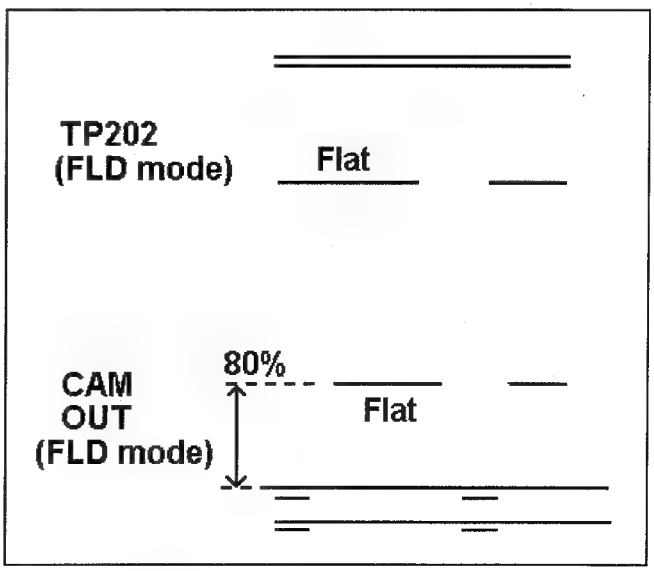
1. Set the EVR to [1E][3A][00].
2. Select PRESET position in AWB mode.
3. Execute the ABB function.
4. Open the iris until upper three steps are saturated in grayscale waveform as shown in figure.
5. Adjust the **VR7** and **VR9** alternately so that the carrier level is minimized. (less than 6IRE)
6. After the adjustment, confirm the CDS DC Adjustment.



5-14. Analog White Shading Adjustment

BOARD	Pre Process
TEST	CAM OUT(75Ω terminated), TP202
ADJUST	EVR
M.EQ	Waveform Monitor, Vector Scope, EVR Lens(Built-in Extender) Light Box(Spherical Type)

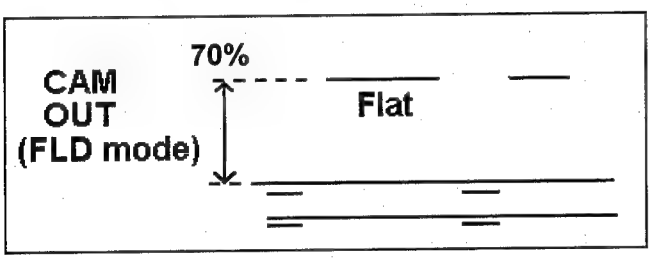
1. Set the EVR to [1E][2E][00].
2. Open the iris until the peak level is 80% in CAM OUT **without extender**.
3. Select A position in AWB mode and execute the AWB function.
4. Execute the ABB function.
5. Adjust the iris to 80% again until the peak level is 80% and execute the AWB function.
6. Set the EVR to [0E][80][0E].
7. Monitor the **TP202** in waveform monitor(field mode) and press [→] or [←] key in EVR so that the waveform is flat.
8. Input [1E][2F][00] in EVR to execute the analog white shading. (While executing, 'ACTIVE' is displayed on EVF.)
9. Execute the AWB function.
10. Monitor the **TP202** in vector scope and confirm that the dot is round and around the center of the scope.
11. Open the iris until the peak level is 80% in CAM OUT **with extender**.
12. Execute the AWB function and repeat 6 to 10.



5-15. Digital White Shading Adjustment

TEST	CAM OUT(75Ω terminated)
ADJUST	EVR
M.EQ	Waveform Monitor, Vector Scope, EVR Lens(Built-in Extender) Light Box(Spherical Type)

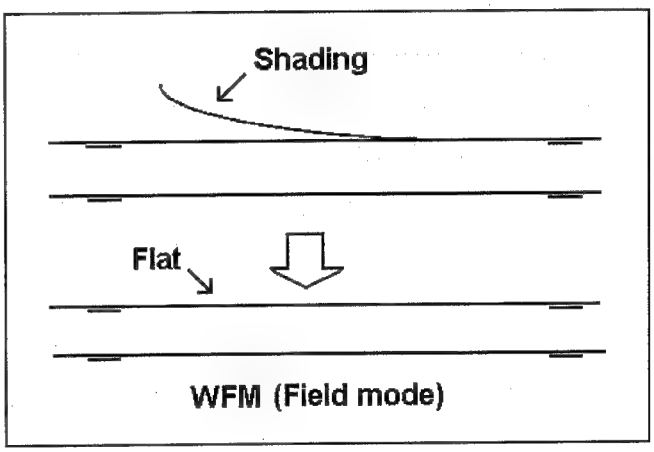
1. Set the EVR to [1E][30][00].
2. Open the iris until the peak level is 70% in CAM OUT **without extender**.
3. Select A position in AWB mode and execute the AWB function.
4. Input [1E][31][00] in EVR to execute the digital white shading. (While executing, '＊' or 'ACTIVE' is displayed on EVF.)
5. Execute the AWB function.
6. Monitor the CAM OUT in waveform monitor(field mode) and confirm that the waveform is flat.
7. Monitor the CAM OUT in vector scope and confirm that the dot is round and around the center of the scope.



5-16. Auto Dark Shading Adjustment

TEST	CAM OUT(75Ω terminated)
ADJUST	EVR
F.NBR.	Close
M.EQ	Waveform Monitor, EVR

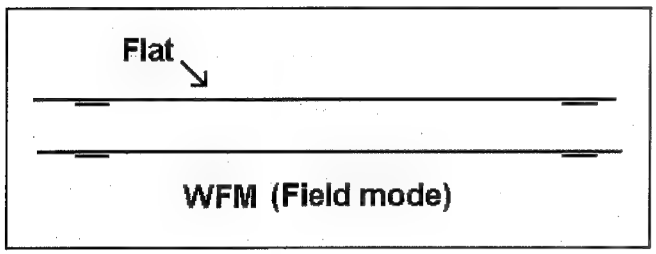
1. Set AWB position to PRE.
2. Execute the ABB function.
3. Input [1E][2A][00] in EVR to confirm executing the auto dark shading.
4. Monitor the CAM OUT in waveform monitor (field mode) and confirm that the waveform is made flat.
5. Confirm that the shading is completed and waveform is flat.



5-17. Digital Dark Shading Adjustment

TEST	CAM OUT(75Ω terminated)
ADJUST	EVR
F.NBR.	Close
M.EQ	Waveform Monitor, EVR

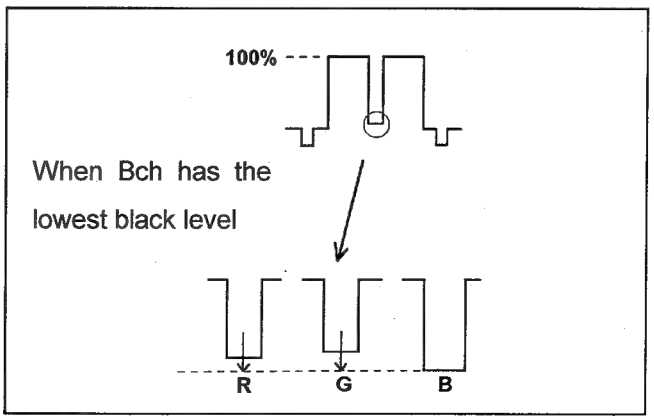
1. Set AWB position to PRE.
2. Input [1E][2B][00] in EVR.
3. Input [1E][2D][00] in EVR to execute the digital dark shading. (While executing, 'ACTIVE' is displayed on EVF.)
4. Monitor the CAM OUT in waveform(field mode) monitor and confirm that the waveform is flat.



5-18. Flare Correction Adjustment

TEST	VIDEO OUT
ADJUST	EVR
F.NBR.	(2000LUX)
CHART	Flare chart
M.EQ	Waveform Monitor, EVR

1. Open the iris until white level is 80%.
2. Execute AWB function in the A ch and then ABB function.
3. Adjust the iris again and execute AWB function in the A ch.
4. Open the iris until white level is 100%.
5. Open the iris 1.5 steps more, for example, F8 to F5.6-1/2.
6. Input [1E][32][[00] in EVR to select Rch and measure the black level.
7. Input [1E][33][[00] in EVR to select Gch and measure the black level.
8. Input [1E][34][[00] in EVR to select Bch and measure the black level.
9. Don't adjust the channel which has the lowest black level.
10. Adjust the black levels of other two channels to the level of the channel mentioned above No.9 with EVR. The ways to change the black levels are as shown below.
    (R ch) After inputting [1E][32][[00] and then [0E][00][0B], press [→] or [←] key.
    (G ch) After inputting [1E][33][[00] and then [0E][00][0C], press [→] or [←] key.
    (B ch) After inputting [1E][34][[00] and then [0E][00][0D], press [→] or [←] key.



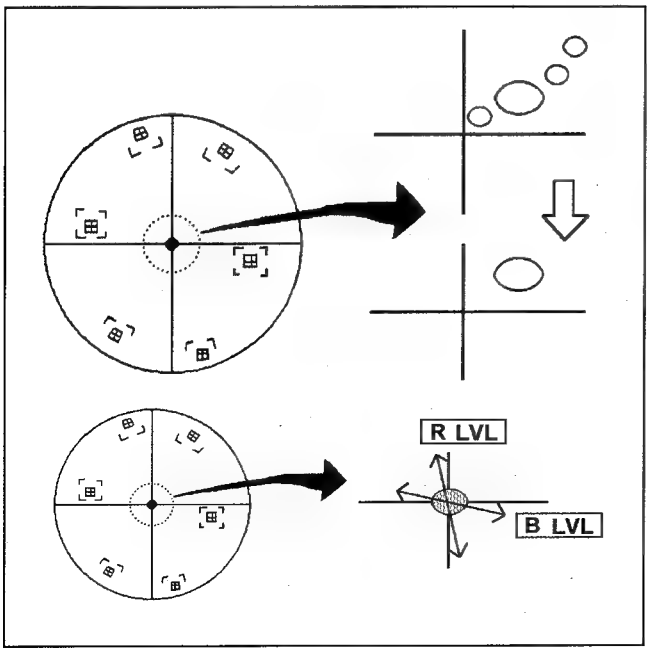
5-19. R γ & B γ Adjustment

BOARD	CDS
TEST	CAM OUT(75Ω terminated)
ADJUST	VR101(R LVL), VR301(B LVL), EVR
F.NBR.	(2000LUX)
CHART	Grayscale Chart(3200 ° K)
M.EQ	Vector Scope, Lux Meter, Color Pyrometer, EVR

1. Set the Vector Scope to Gain:MAX.
2. Input [1E][27][00] in EVR.
3. Select PRESET position in AWB mode.
4. Execute the ABB function.
5. Open the iris until the peak level is 100% in CAM OUT **without extender**. Confirm that the iris No. is F8 to F8-1/2.
6. When the dot is divided, adjust the R γ and B γ with EVR according to the following procedure so that the dots are joined.
   - **R γ**: After inputting [0E][00][09] in EVR, press the [→] or [←] to adjust.
   - **B γ**: After inputting [0E][00][0A] in EVR, press the [→] or [←] to adjust.
7. Confirm that the dot is at the center of the vector scope. If not, adjust the **VR101**(R LVL) and **VR301**(B LVL).

Note.

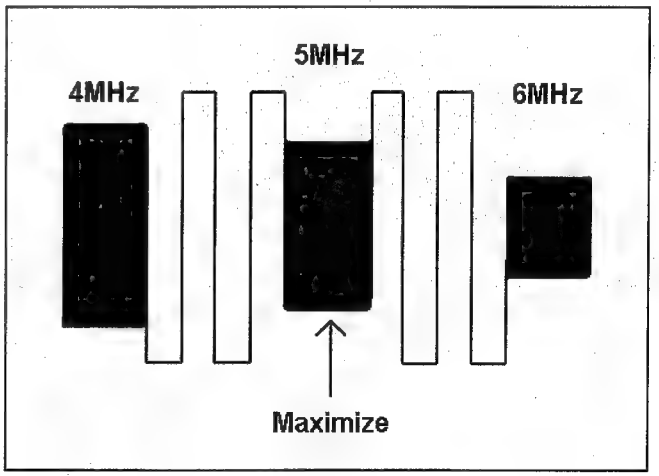
1. Vertically divided : Adjust R γ
   Horizontally divided : Adjust B γ



5-20. Modulation Adjustment

BOARD	Pulse, Sync
SPEC.	MAX at 5MHz
TEST	CAM OUT (75Ω terminated)
ADJUST	VR14(MOD)(Pulse) VR201, VR202, VR203(Sync)
CHART	Immega Chart
M.EQ	Waveform Monitor, EVR

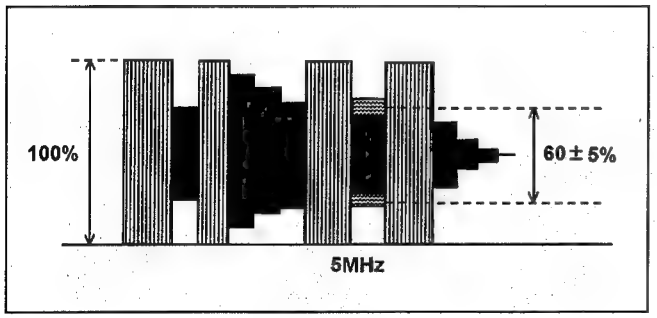
1. Turn the **VR14** fully counterclockwise.
2. Set Gain SW to L.
3. Press the [F2] and [3] keys to set the EVR to [1E][35][00].
4. Open the iris until white level is 80%.
5. Execute AWB function in the A ch.
6. Open the iris until white level is 90%.
7. Turn the **VR201**(Sync) counterclockwise fully.
8. Turn the **VR201** clockwise until the level at 5MHz is maximized first.
9. Set shutter to 1/2000.
10. Set Gain SW to M.
11. Repeat from 6 to 8 with **VR202**(Sync).
12. Set Gain SW to H.
13. Repeat from 6 to 8 with **VR203**(Sync).
14. Set shutter OFF and Gain L.



5-21. Modulation Confirmation

BOARD	Pulse
SPEC.	60±5% at 5MHz
TEST	CAM OUT (75Ω terminated)
ADJUST	VR2(CLMP PH)(Pulse)
CHART	Immega Chart
M.EQ	Waveform Monitor, EVR

1. Press the [F2] and [3] keys to set the EVR to [1E][35][00].
2. Open the iris until white level is 80%.
3. Execute AWB function in the A ch.
4. Open the iris F5.6~F4.
5. Confirm that the level at 5MHz is within specification.
6. If not, fine adjust the **VR2**. When **VR2** is adjusted, open the iris until white level is 80% and execute AWB function in the A ch.
7. Confirm that the level at 5MHz is within specification. (60±10% is accepted only when **VR2** is fully-turned.)
8. When **VR2** is adjusted, repeat from Modulation Adjustment.
9. Finally set the EVR to [1E][3A][00].

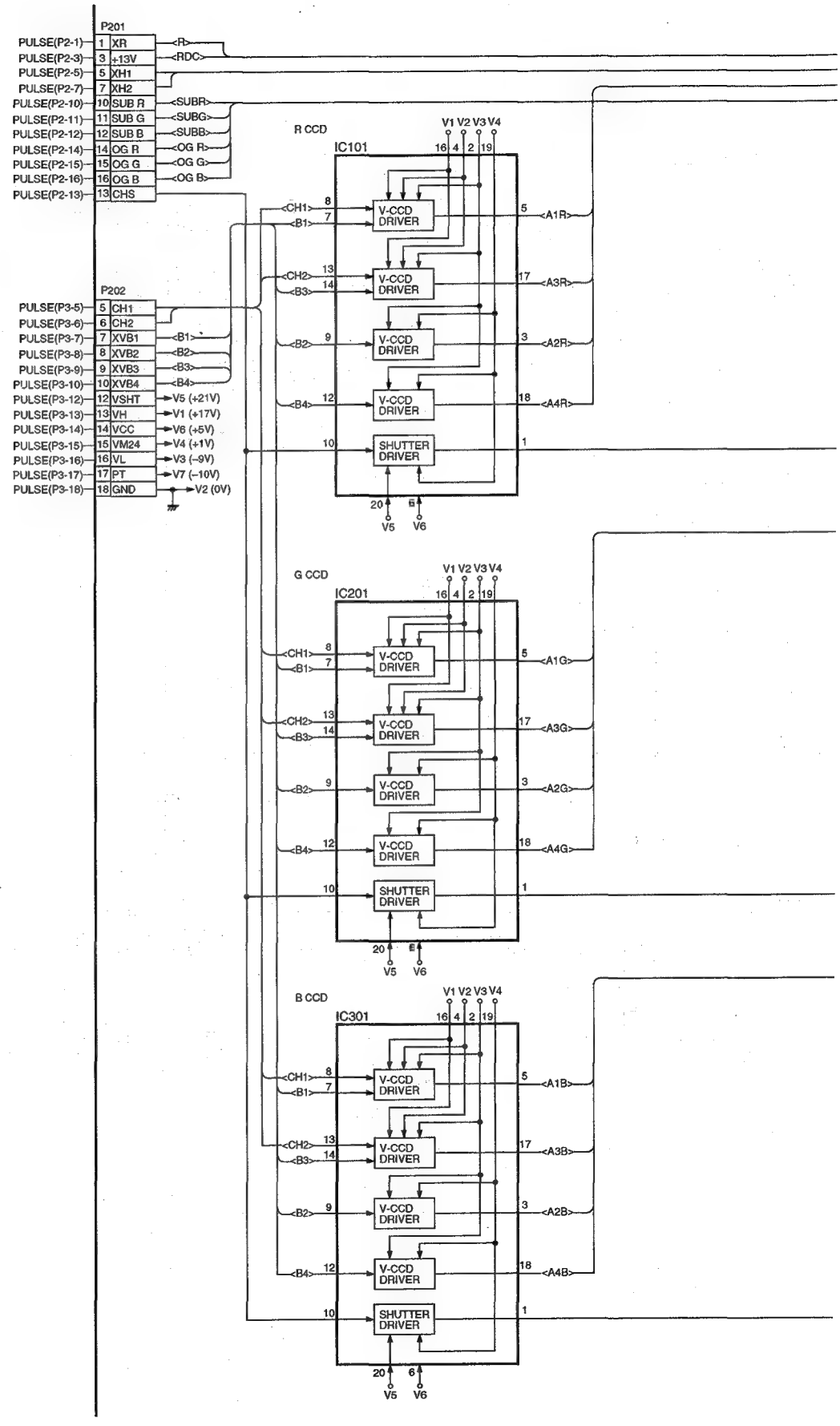


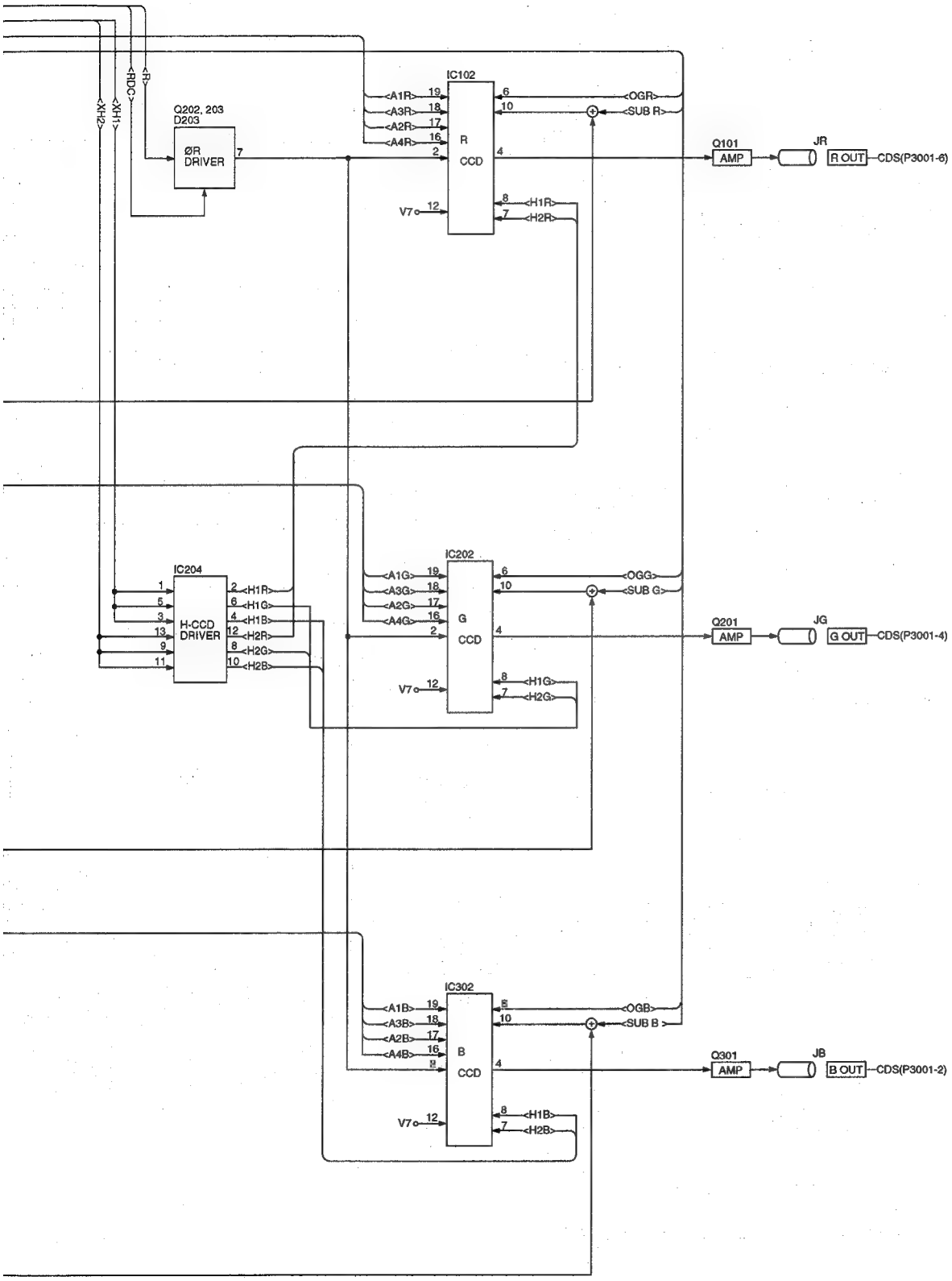
BLOCK DIAGRAMS

CONTENTS

PULSE BLOCK DIAGRAM BLK-1
CCD BLOCK DIAGRAM BLK-2

CCD BLOCK DIAGRAM

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ØR
DRIVER
7
IC102
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Q301
AMP
JB
B OUT
CDS(P3001-2)

Order No. VSD9909SB718

Technical Bulletin

Supplement to the Service Manual

Broadcast Product

Subject : Addition of Screw Adhesive

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AJ-D700E/EN	124	VSD9605M501A/B	I9TKA0001
AJ-D700AE	2	VSD9909M910A/B	I9TKA0001
AJ-D400E	4	VSD9903M004A/B	I9TKA0001
AJ-D800E/EN	86	VSD9708M606A/B	I9TKA0001
AJ-D800AE	2	VSD9909M910A/B	I9TKA0001

Frame Assembly (1) V17728# 1038021
Frame Assembly (2) V25223# 2029034
EVF Assembly V24553# 1017171
V2016I# 1031032
~~V25223# 2025084~~ doppelt !

Symptom : The screws on the Frame Assembly (1), (2) and EVF Assembly sections may be loosened.

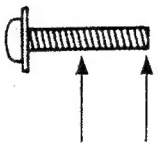
Remedy : Screw adhesive is applied to the screws on the Frame Assembly (1), (2) and EVF Assembly sections.

1. Regarding the locations of the adhesive application to the screws on the Frame Assembly (1), (2) and EVF Assembly sections, refer to the next page.

2. Specification of screw adhesive application

   * Approx. 0.02g of the adhesive must be applied to the surface of the thread from the tip to the half of the thread section.

   Note
   After applying the adhesive, check that it covers the visible area on the thread.



Apply adhesive to the half of the thread section.

TM4211TM4226TM4229:3

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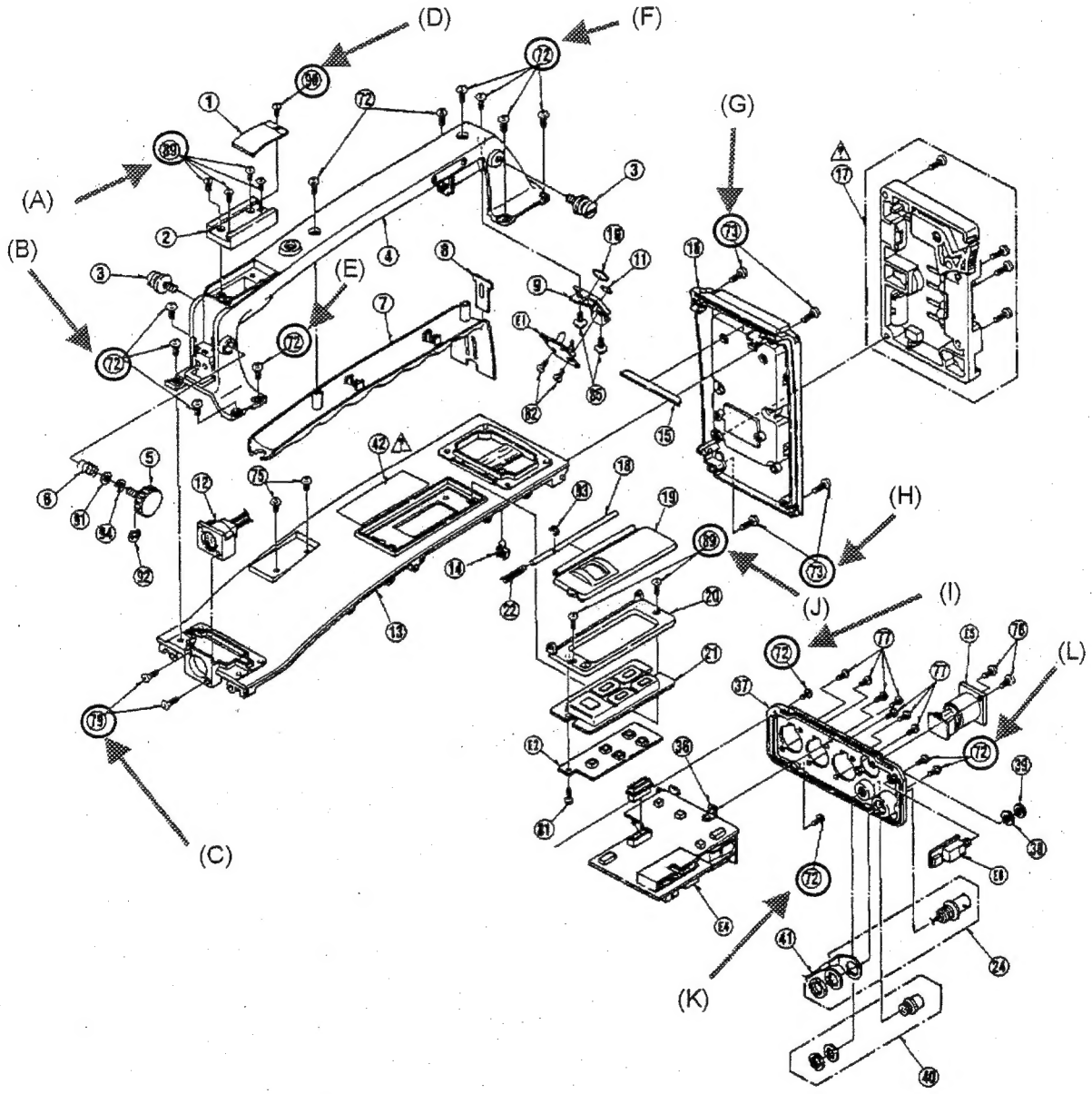
Adhesive Application Positions

1) Frame Assembly (1) ... 25 positions
2) Frame Assembly (2) ... 6 positions
3). EVF Assembly ..... 1 position

Reference Exploded Views of Adhesive Application Locations

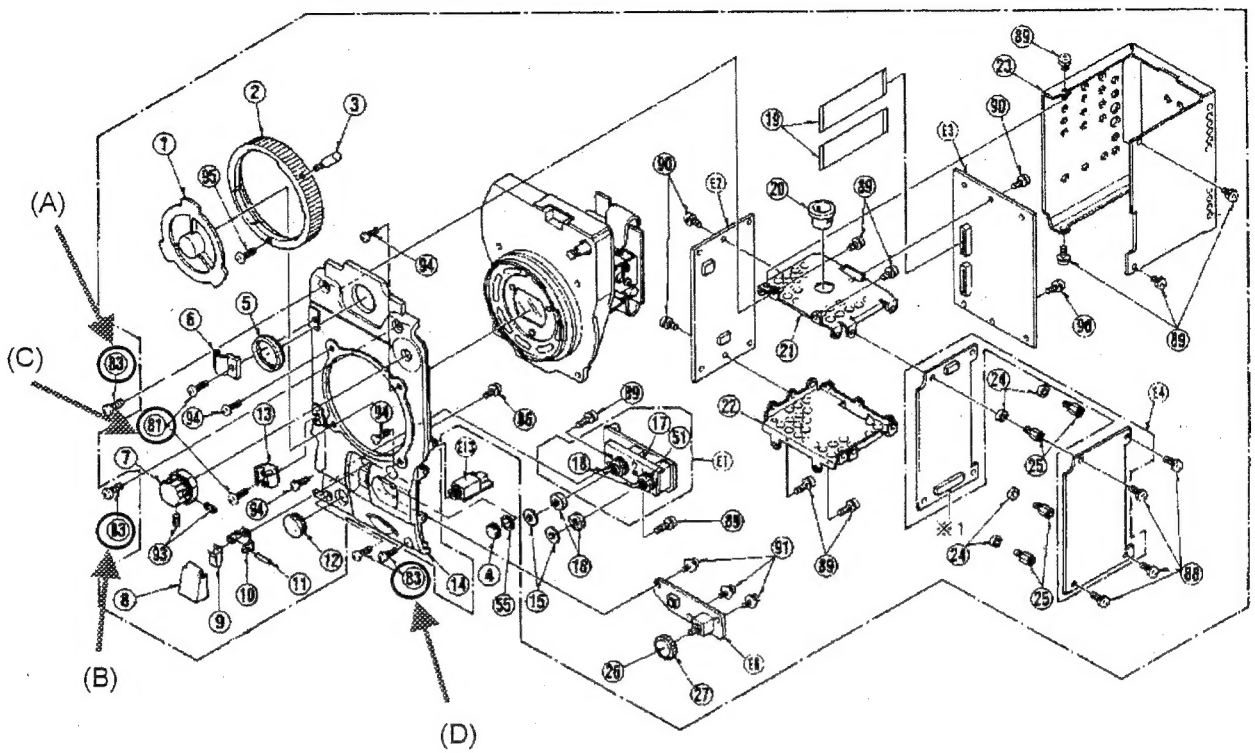
* As per the Exploded View of Service Manual

1). Frame Assembly (1)
(Application locations)
A (X4), B (X3), C (X2), D (X1), E (X1), F (X4), G (X2), H (X2), I (X1), J (X2), K (X1), L (X2)

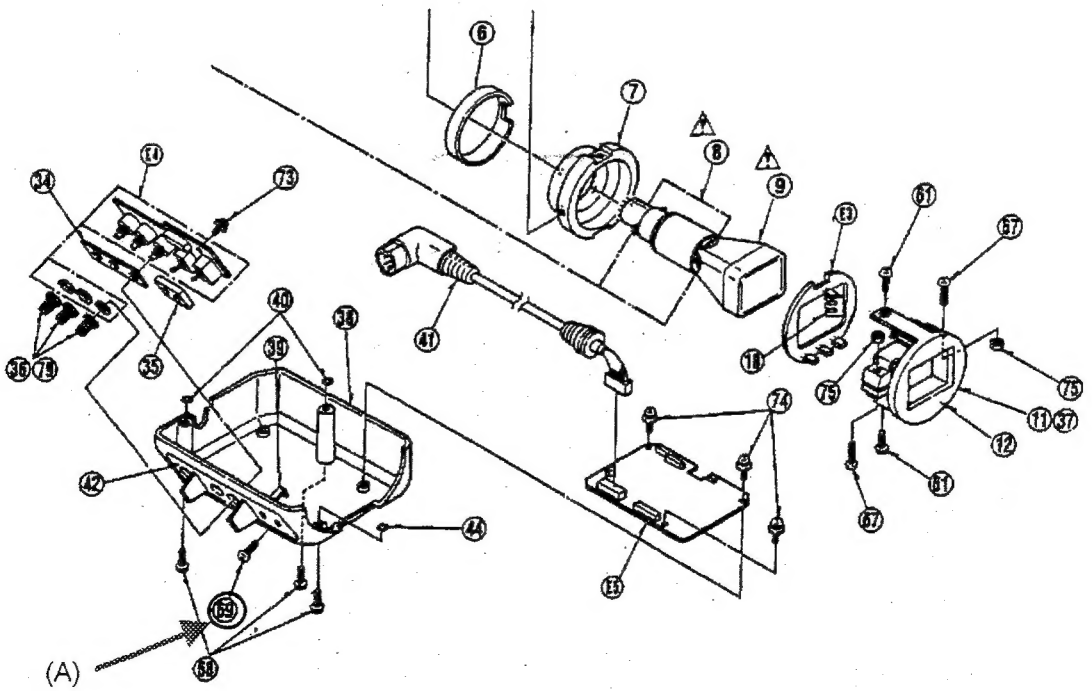


Note: AJ-D800E/EN and AJ-D800AE are not applied the screw adhesive to "D" portion because of no use of the Leaf Spring (Reference No. <1>).

2). Frame Assembly (2)
(Application locations)
A (X1), B (X1), C (X2), D (X2)



3). EVF Assembly
(Application location)
A (X1)



Order No. VSD9909SB719

Technical Bulletin

Supplement to the Service Manual

Broadcast Product

Subject : Flash of Tally Lamp

Please use this supplement together with the Service Manual as follows :			
Model No.	Bulletin No.	Order No.	Effective from
AJ-D700AE	3	VSD9909M910A/B	I9TKA0001

Board : VTR SYSCON (VEP06A22G)

V25223 # 2029084

Symptom : Though recording is actually carried on, the tally lamp may flash (normally, it should be lighted).

Cause : When the position switch overruns during REC, the VTR SYSCON judges loading to be uncompleted. So the tally lamp flashes though recording is carried on.

Remedy : The software of VTR SYSCON has been modified so that the tally lamp is lighted during REC even when the position switch overruns.

Part Number					
Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	Remarks
IC6006	VSI3193A	VSI3193B	VTR SYSCON IC (PROM)	1	Ver.<E1.01>→Ver<E1.02>

<TEST MENU>

DATA ROM IC3502 : 1.0
CAM SYSCON IC3505 : 1.0
▒VTR SYSCON IC6006 : E1.02

The marked (*) version is the device which has been changed from this software revision.

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